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Unasylva

Volume IV, Number 4 • October-December 1950

2FEB 1951

Unasylva

An International Review of Forestry and Forest Products

Vol. IV, No. 4 October-December 1950

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Cover photograph by courtesy of the Canadian National Film Board: Control of insect pests by aerial spraying must be carried out under the control of experienced experts.

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Unasylva is prepared by the Division of Forestry and Forest Products and published by the Information Division of FAO at the Organization's temporary headquarters in Washington, D. C. It is printed in Baltimore, Maryland, U.S.A. Unasylva is published in English, French, and Spanish. In conformity with the established custom of FAO, all units of measurement used in Unasylva are given in the author's figures. The metric equivalents are added, where necessary, in parentheses. Unasylva may be obtained from the sales agents listed on the inside back cover. Annual subscription US$2.50, single copy 65 cents; rates are payable *in local currencies* when orders are placed through local sales agents.

Editorial

THE Expanded Technical Assistance Program is a collective endeavor: collective because all the United Nations and the member countries of the specialized agencies are participating or can participate in it.

In a collective undertaking it is well to know how each participant envisages the possibilities and the problems. It was therefore thought useful to provide a representative cross-section of the views of those who have to deal with the new program from the governmental point of view as well as from the technical point of view. The picture presented could not be a complete one. That would have gone far beyond the limits of UNASYLVA. The diversity of approach of the authors who have contributed to this issue does, however, illustrate the great number of problems to be solved. There will be no universal panacea that can be indiscriminately applied: each country's problems will have to be attacked according to the individual circumstances, and the skill of the technical assistance experts will consist in devising solutions best suited to local conditions, economic possibilities, and technical capabilities.

In order to understand clearly the possibilities of the Expanded Technical Assistance Program, it should be borne in mind that the funds are meant to provide countries with technical knowledge; financing undertakings beyond this stage is a separate and very complicated problem. Like all development, it will entail sacrifices to be made by the countries that are to be developed—the same sacrifices that were borne through years, or even centuries, by the countries that can now put their experience at the disposal of others. It may be possible, through the Expanded Technical Assistance Program, to shorten the time element, but not the sum of the effort needed. It is a great endeavor, and it will provide opportunity for the initiative not only of governments and of those organizations and associations created to encourage the development of the various branches of national economies, but also particularly of private industry and enterprise that will have to play an increasingly important part if the Expanded Technical Assistance programs are to achieve their full scope.

The Technical Assistance Agreement with Guatemala is signed by Senor Dr. Don Antonio Goubaud-Carrera, Ambassador for Guatemala to the United States of America, and Norris E. Dodd, Director-General of FAO.

RK HERALD TRIBUNE, MONDAY, SEPTE

The U. N. Agenda

Monday, Sept. 11—Saturday, Sept. 16

F. A. O. to Aid Guatemala and Burma in Forestry Projects; Security Council Meets Today

AID—With signing of agreements for forestry development in Guatemala and Burma, the

Food and Agriculture Organization announced its expanded technical aid for underdeveloped areas is now under way. In Guatemala, the jointly financed program will send F.A.O. experts to work for up to twelve months on conservation of forest resources to stabilize water supplies and control floods, protection of insect-threatened pine forests, and training of Guatemalan experts. In Burma, an F. A. O. expert will help try to set up an integrated forest industry from saw milling to manufacturing, while two Burmese forest officers will study American and European industries on traveling fellowships.

SECURITY COUNCIL—A So- proposal to invite Commu-

achieving more modern climb performance requirements for international passenger planes will be discussed at a meeting in Paris Thursday, to which technicians from fifty-eight member nations of the Interna tional Civil Aviation Orga tion have been invite would link rate of clim ing speed. The othe on mathematical a operating experie

MEETING week incl pert con day P

The Expanded Program of Technical Assistance

By M. PEREZ-GUERRERO

Executive Secretary, Technical Assistance Board, United Nations

THE Expanded Program of Technical Assistance for economic development of underdeveloped countries, which recently was undertaken by the United Nations and the specialized agencies, has a history going back to the San Francisco Conference of 1945. The signatories of the United Nations Charter were aware that it was insufficient to create an organization which should attempt to maintain international peace and security without at the same time promoting the economic and social conditions of peace. They, therefore, pledged themselves in Article 55 to work for "higher standards of living, full employment and conditions of economic and social progress and development."

The tremendous and dangerous disparity between the standard of living in the advanced and the underdeveloped countries was illustrated in a recent UN study. In 1947 it was estimated that the average income per caput in the United States of America was over $1,400 and in another 14 countries it ranged between $1,400 and $900. But in 25 other countries, comprising more than half the world's population, the average income was less than $100 a year. This inequality was nothing new. But it has been emphasized after the war by the emergence in Asia of substantial new independent nations, India, Pakistan, Indonesia, Burma, and Ceylon, whose elected governments are pledged to momentous programs for the improvement of the standard of living and whose populations are increasingly impatient of existing standards. The basic problem in these and other underdeveloped countries is constant pressure on the land, creating a vicious circle of poverty; poverty preventing investment in new agricultural equipment which would produce better crops, or an industry which would create new employment; poverty which prevents the effective eradication and treatment of disease and of illiteracy.

To overcome this poverty capital investment is required—new industrial and agricultural machinery, power plants, medicines, transport equipment. But at an earlier stage what is more urgently required is planning and technical advice. Adult illiteracy, for instance, is not abolished by building schools but by finding the best medium for approaching the illiterate. In the eradication of disease, to persuade the villager to adopt simple sanitary precautions is as important as to provide medicines. And the best industrial machinery is useless without trained mechanics to maintain it.

The United Nations and the specialized agencies are in no position to provide loans or investments, but they can, and always have seen it as one of their most important functions, provide experts to visit countries which require advice and technical instruction, and, what is equally important, provide training abroad for nationals of underdeveloped countries. Even before the announcement of President Truman's Point Four Program the United Nations General Assembly had appropriated a modest sum for a technical assistance program. This was used to organize expert missions to advise governments on their economic development programs and to offer fellowships for advanced technical training abroad.

Financing the Program

It was, however, as a result of President Truman's initiative that the Economic and Social Council (ECOSOC) in February 1949 asked the Secretary-General and the heads of the specialized agencies to work out a "comprehensive plan for the expanded program of technical assistance," and in August 1949, having considered that plan, evolved in Resolution 222(IX) detailed machinery for its administration. What remained was to find the money to finance it, and in July 1950 all members, not only of the United Nations but also of the specialized agencies, were invited to Lake Success to pledge contributions to a new Technical Assistance Fund. In a remarkablely short and harmonious conference just over $20 million was pledged for the first 18 months of the scheme.

By the end of August about 11 percent of the pledged funds had already been paid in, and a start had been made with the operation. Under Resolution 222(IX) the method of work had been very carefully prescribed. The first $10 million of the contribution is automatically available for distribution among the

participating organizations in fixed proportions. These organizations are, in addition to the United Nations, the following specialized agencies: Food and Agriculture Organization of the United Nations (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), International Civil Aviation Organization (ICAO), and World Health Organization (WHO). The organizations provide expert technicians or training facilities only in response to requests from governments, and not from individuals or private organizations. To ensure co-ordination and to prevent any duplication of work, a Technical Assistance Board (TAB) has been set up on which each agency is represented, and in whose discussions the International Bank and the International Monetary Fund participate. The Board agrees on the establishment of joint missions to visit countries which have manifold problems for which technical assistance has been requested. It prepares background studies. It arranges for the necessary currency clearings. It sets common standards for experts and fellows. It arranges for the appointment of Resident Technical Assistance Representatives who are stationed in individual countries to advise governments on their requirements of technical assistance in relation to the developmental needs of the country and the resources at the disposal of the organization. The Board also maintains working relationships with other technical assistance schemes such as that of the Organization of American States. The Technical Assistance Board remains responsible to the Economic and Social Council which has set up a Technical Assistance Committee (TAC) consisting of its full membership, to receive regular reports from the Board.

The Work in Hand

Such, briefly, is the history of the creation of the expanded program. Its future can perhaps be indicated from the numerous requests for assistance which have already been received from every continent. To note a few samples among them, the United Nations secretariat itself has been asked for economic advisers, statisticians, and experts in social welfare. The International Labour Organisation has been asked to advise on co-operatives and social insurance. FAO has been asked to provide experts in agriculture, fisheries, and forestry; UNESCO to advise on general education and illiteracy. ICAO has been asked for aviation experts; WHO for public health, malaria, tuberculosis, and typhus control experts.

Why must so wide a field be covered by the United Nations and the specialized agencies, when other means for carrying out technical assistance have existed for many years? This question was answered by the Secretary-General in opening the Technical Assistance Conference of June 1950. The program, he said, "is founded on the principle of universality—universality of participation, of contribution and of benefits. . . . It demonstrates the United Nations spirit by the fact that the underdeveloped countries will share in its direction and administration on a basis of full equality with the more developed countries. None of the abuses associated with past experiences of political or economic domination of one country by another are possible."

Though the new program has made a sound start and a lot can be expected from it, its limitations should not be overlooked. Twenty million dollars is a small sum in relation to the appalling poverty of great areas of Asia and of Latin America. The expanded program cannot provide capital, nor indeed equipment except the minimum necessary for demonstration purposes. The number of well trained experts available for technical assistance work is also limited. By itself it can hardly raise the standard of living of any country. It depends for its usefulness on the energy and resourcefulness of the requesting nations in implementing the recommendations of the experts. But already it is clear that since the war there is a much wider intolerance of poverty, illiteracy, and disease in the world. Wherever governments are prepared to make efforts and even sacrifices to raise the standard of living and seek technical advice in doing so, they will find a sympathetic and unprejudiced source of assistance in the United Nations and the specialized agencies.

What Is Technical Assistance?

By SIR GERARD CLAUSON, K.C.M.G., O.B.E.

Assistant Under-Secretary of State, Colonial Office, London

TECHNICAL Assistance is not a new concept; it is one of the oldest things in the world. Probably the first time it occurred was when Eve, with her superior sense of dress, helped Adam fix his fig leaf. "Technical assistance," in the sense in which the words are used in the phrase, "An expanded program of technical assistance to underdeveloped countries," is merely one application of a primordial human activity, but an application which is not as well understood as it should be, even in the underdeveloped countries to which this new prospect of help in solving their problems is held out.

Just as there is nothing new in the concept of technical assistance, so also there is nothing new in the concept of technical assistance to underdeveloped countries. Most countries in the world have received technical assistance from other countries at some period in the course of their history; and for centuries now individuals or corporations from the more advanced countries have deliberately gone to less advanced countries to help them in their development. Indeed for a good many years the governments of the more advanced countries, as well as the citizens, have taken a hand in the process. But until recently it

The opening up of vast tropical forests needs specialized experience.

never occurred to any government that its obligation to give technical assistance extended beyond the dependent territories for which, in the modern phrase, it had international responsibility. What is new in the expanded program launched under President Truman's inspiration is that, for the first time in history, most nations in the world have publicly accepted a financial obligation to take part in a co-operative program of technical assistance to the underdeveloped countries and bound themselves to do all that they can to make it a success.

The course of events since President Truman included Point Four in his famous inaugural address is too well known to need description, but particular attention should be given to the statement of principles annexed to the Economic and Social Council's resolution of August 1949, which has since been approved by the Assembly of the United Nations and the Technical Assistance Conference at Lake Success as governing the implementation of the program.

It would take more space than is available here to discuss these principles at length; the purpose of this article is merely to discuss their application within the field of forestry; but one preliminary observation is important. "Technical assistance" has limits which are clearly defined, and it is not worth giving it unless it is known in advance that certain conditions exist which will make it useful. To take a simple analogy, if a man's automobile has broken down and he asks for help to get it going again, technical assistance, in the form approved by the ECOSOC principles, would extend to looking at the automobile and telling the owner what had gone wrong and how it could be put right; it would not, however, extend to doing the repair job for him, or giving him the spare part necessary to put it right. That he must do for himself at his own expense, that is with his own money or a loan, if anyone will give him one. So it is no use giving a man technical assistance in such a case if he is obviously as broke as his automobile, and it is known that no one will lend him the money to mend it. Technical assistance, in short, is a procedure for helping underdeveloped countries to help themselves; it is not a procedure for giving or lending them money to be spent on actual development.

An underdeveloped country either has forests or it has none. If it has forests, they are either left to themselves or they are exploited, more or less. If they are exploited, they are exploited either scientifically and properly, or unscientifically and harmfully. If a country has no forests, either the soil and physical conditions are suitable for forest cultivation or they are not. The only country which has no use for technical assistance in the field of forestry is the country which has no forests and knows that there is no prospect of establishing them. Every other kind of country may need technical assistance; even the country at the extreme opposite end of the scale which has forests properly and scientifically exploited may need technical assistance in the form of facilities for its forest officers to visit other countries and study their methods.

Forms of Technical Assistance

The form of technical assistance which the individual country will require depends of course on its actual circumstances, but, broadly speaking, it will fall within one of the following groups:

(1) If a country has no forests, but thinks that they could be established and would be economically

valuable, it requires the services of an expert silviculturist to examine the land and advise whether it is suitable for forest development. It is not, of course, realistic to suggest that this would be an isolated mission. There would be no sense in having an area examined simply from one point of view. What would be required would be a land survey conducted by a small team of agricultural, forestry, and animal breeding experts to look at the area in all its aspects and advise on the best use to be made of it.

(2) If the conclusion is that forest cultivation is probably the most economic method of developing the area, the next step would be a pilot project, that is the experimental establishment of a small forest to determine whether this judgment is correct. This would require the services of several experts over a period of some years to conduct the experiment.

(3) If the experiment is successful, the next stage would be to build up the forests and a forest service, side by side, and the forms of technical assistance required would be much the same as those which would be required by a country which has unexploited forests.

(4) If a country has forests which are unexploited, it requires first the services of a small team composed of, say, a silviculturist, a soil scientist and an expert in forest management to advise whether the forest can safely be exploited. This may not always be the case. If the soil is very poor, it may not be possible to reestablish cultivation of it if the forest cover is removed, and the only result of exploitation would be a galloping attack of soil erosion. If, however, the verdict was favorable, the mission would provide a plan of rational exploitation.

(5) Such a plan would not be one for immediate execution. The essential first step would be to build up a staff of forest technicians and forest guards to supervise the work of exploitation. The time is long past when it would be regarded as sensible to give a concession to some private profit-making organization to exploit the forest without proper supervision. Forestry is such a long-term project that it is not reasonable to expect that an enterprise whose main purpose is the making of immediate profits would, without outside stimulus, devote part of those profits to reinvestment in trees which will not in any event be ready for felling for decades and may not be really ready for hundreds of years. Moreover, even if, in principle, the forest is exploitable, it may be essential to leave parts of it untouched in such areas as the headwaters of rivers and streams, if the general agricultural economy of the country is not to suffer injury.

The first need in such a case, therefore, would be for a certain number of foreign experts, serving on medium- or long-term contracts, to start the forest service and train local personnel for it. Simultaneously, facilities would be required for sending local personnel with an adequate educational background to be trained for future work in the forest service in training establishments abroad. The size of the cadres required would depend not only on the size of the forests but also on the country's decision whether to entrust the exploitation of the forests to private enterprise or to carry out the work as a government undertaking. In the first event all that would be required would be a limited number of scientifically trained supervisors and an appropriate number of forest guards. In the latter event a whole range of silviculturists, experts in forest management and timber exploitation and conversion, and skilled forest workers would be required, and the task of recruiting and training them would be proportionately the greater.

(6) If a country has forests which are already being exploited, the extent to which it will require help and the kind of help which it will require will depend on the extent to which the exploitation is already being controlled. If it already has a fully developed forest service, it will probably require no more than facilities to send members of that service to study methods of forest management and exploitation in other countries, facilities to send recruits for the service to training establishments abroad, and facilities for its representatives to study how the timber exported from the country is marketed and to find out whether an alteration in the extraction and conversion methods would make it possible to increase the foreign revenue. On the other hand, if the exploitation of the forests is imperfectly controlled or not controlled at all, the country will require the same kind of help as a country where the forests are not at present being exploited at all.

This is not, of course, a complete and exhaustive treatise on the application of technical assistance to forestry in all its aspects, nor is it written by a technical expert in forestry matters. It is merely a broad picture of the subject designed to help those responsible for the government, the general administration, or the forestry departments of underdeveloped countries to consider what technical assistance they should request from the Food and Agriculture Organization.

One final word of warning. Forestry experts are rare animals, and most of them are fully occupied with responsible work in their own countries. It must not be assumed that they can be obtained in large numbers just for the asking.

Bullock-drawn high-wheeled carts are still used to haul sal (Shorea robusta) logs in remote areas in India, where better roads and modern equipment could step-up production. Travel is so slow that fodder must be carried for the bullocks enroute.

Progress of Point Four

By HIS EXCELLENCY B. R. SEN
Ambassador of India to Italy and Yugoslavia

IT IS now nearly two years since President Truman spoke of the need of a "bold new program" for the improvement and growth of underdeveloped countries. During these two years no problem in the international economic field has engaged so much public attention and interest as this problem of underdeveloped areas. As India's delegate to the Eighth Session of the Economic and Social Council, when the Point Four of President Truman's speech came up for the first time before the United Nations, I was privileged to analyze the problem and the actions proposed. It is interesting for me to have this opportunity to see the problem once again in the light of the discussions which have since taken place.

It is well known that throughout history there has been no greater source of international rivalry than the lure of economic domination of underdeveloped countries. One need refer only to the history of the rivalries of the European powers for colonial possessions since the sixteenth century to realize this historical fact. The origin of the two world wars can also be traced to this same motive, though people have sought to clothe it with other unrecognizable names. This fact found international recognition, though in a rather indirect way, in the Covenant of the League of Nations, in Articles 22 and 23 relating to the mandated territories. It found full and unequivocal recognition in Chapters IX and X of the Charter of the United Nations.

It will be noticed that both in the United Nations Charter and President Truman's address the need of international co-operation to develop underdeveloped areas is firmly represented as a means to insure international peace. The objective of the scheme of international economic and social co-operation is thus set out in Article 55 of the United Nations Charter: "With a view to creation of conditions of stability and well-being necessary for peaceful and friendly relations among nations based on respect for the principle of equal rights and self-determination of peoples, the United Nations shall promote. . . ." President Truman's Point Four is stated by him as one of the "four major courses of action in our program for peace and freedom in the coming years," the other three major courses of action being: (1) unfaltering support to the United Nations and related agencies, (2) continuance of the program for world economic recovery, and (3) the strengthening of freedom-loving nations against the dangers of aggression.

The importance of President Truman's declaration lies not in the originality of his concept, but in the forthrightness of his approach which, as the head of a country which more than any other is in a position today to implement such a policy on a wide scale, gave the matter an urgency and practical direction hitherto lacking in normal international discussion implementing the provisions of the UN Charter. President Truman placed the essentials of the problem in a truer perspective than had ever been done before. He pointed out that the problem had two integral parts: (a) international flow of technical knowledge and (b) international flow of capital investment.

Problems Confronting the Program

Since President Truman made his declaration, two tendencies have been noticeable—one to minimize the importance of capital investment as an integral part of the scheme; the other to depart from the context of international peace as set out both in the UN Charter and by President Truman. There has been a third tendency, viz., to advocate technical assistance for *primary* production only so as not to encourage any substantial deviation from the present pattern of national economy in different countries, and to exclude assistance for other developments, however necessary or desirable the country concerned may consider them to an over-all improvement of its economy.

The tendency on the part of some of the important countries to soft-pedal the question of international capital has been noticeable from the very beginning. There are of course various practical difficulties. Though some of the foreign capital needed can be found through loans and grants from the more fortunately placed governments, the bulk of it must come from private investment. But the present unstable political conditions, balance-of-payments difficulties leading to limitations of the right to transfer earnings and capital, fear of loss of ownership without compensation, and restrictions imposed by governments on the operations of foreign enterprise act as serious deterrents to the flow of private capital.

The difficulties, however, are not insuperable and in any case must be faced. The stake—maintenance of world peace and freedom—is high. We need men of vision and idealism to handle this problem—men who would not easily be thwarted by practical difficulties. Lately there has been a hopeful development. In May this year a meeting of the Consultative Committee of the Commonwealth countries (except South Africa) was held at Sydney, Australia, to plan the economic development of South and Southeast Asia where poor living conditions are an increasing threat to the peace and freedom not only of Asia but of the world. The main recommendations of the Commonwealth Committee were: (1) preparation of a six-year development plan for the region, and (2) inauguration of a Commonwealth Technical Assistance Scheme involving an investment of £8 million over a period of three years. The committee is now meeting again in London to carry the recommendations to the stage of execution. The non-Commonwealth countries in the region have also been invited to participate in the discussions.

The Commonwealth Consultative Committee appears to be proceeding on the following lines: (a) for the encouragement of international investment, the first thing necessary is to prepare a comprehensive development scheme covering the entire economy

of the countries concerned; (b) as the major part of the capital investment for such a scheme must come from sources within the country itself, the scheme should attempt to assess those resources as closely as possible; (c) having screened the plans put forward under (a) and (b) the Consultative Committee will decide to what extent assistance can come from the Commonwealth countries and what assistance should be sought from other countries, particularly the United States of America; (d) the Consultative Committee will also discuss measures which must be taken by the countries concerned to build up confidence and create conditions to attract foreign capital. This appears to be the most positive and practical step forward in this field since President Truman announced Point Four. The seal of approval to the development schemes of a country by such a highly authoritative body as the Commonwealth Committee should be a help in creating confidence in foreign investors, which is now somewhat lacking.

Industrial Development

That international capital under Point Four should be made available only for developing primary production is another of those suggestions which emanate from men who are too preoccupied with immediate practical difficulties. There are several countries in Asia and Latin America where industrial development fostered by foreign investment may bring about such a revolution in the methods of production that not only manufacturing industries but also primary industries like agriculture, mining, etc., may benefit. The essential point is that by the adoption of scientific methods of production, which go hand in hand with the process of industrialization, the period of apprenticeship which a pioneer industrial country like the United Kingdom had to undergo can be substantially reduced. What is needed is a progressive attitude towards industrialization and a general advance on all fronts. It is hoped that the Commonwealth Conference will approach the development of the Southeast Asian countries from this basis.

The tendency to get away from the context of international peace has been particularly noticeable not only in the general discussions of the specialized agencies of the United Nations but also in the discussions which are being held to deal with the problems of certain regions like Europe. The specialized agencies have tended to regard the activities under Point Four as merely an extension of their normal program. The need to develop certain areas with a view to providing certain essential needs of highly industrialized countries has tended to be merged in the Point Four program. Considerations of international peace appear to have been pushed into the background. Since it is clear that the resources available to Point Four assistance are not going to be large, it is necessary that in their distribution those areas which are likely to yield the greatest and most effective results in maintaining and developing international peace should have prior consideration.

In other words, we must devise a system of regional priority with special reference to the fundamental objective of ensuring international peace. I may illustrate this point by referring to Southeast Asia, where new nations after centuries of subjection have emerged into independence, and where, without immediate measures to improve standards of living, present conditions will be an increasing source of danger to international peace.

One of the most encouraging signs of these times has been the growing recognition of the truth which has inspired Point Four. It will be a tragedy if we allow ourselves to be disheartened by immediate practical difficulties or be led away by political slogans which can only end in fresh disaster.

Forestry and the Point Four Program

By E. I. KOTOK

Assistant Chief in Charge of Forest Research, U. S. Forest Service

PRESIDENT TRUMAN'S announcement of the Point Four Program struck a highly responsive chord in the United States of America. Here was a measure which sought through peaceful means to build up a modern economic base over the widest possible area. Its major plank, to bring the "know-how" and capital of the more highly developed countries to the underdeveloped regions of the world, had a particular meaning for the professional men of America. Never in the history of our country had there been as keen an interest in over-all world affairs. The last world war and the exigencies that have grown out of it obviously were the reasons for this.

As discussions of the Point Four Program proceeded, our State Department marshalled together many groups of scientists to consider the scope and the manner in which such a program could be carried out. A good many American foresters were called into these conferences, and they contributed forestry items that might be included in the program. It is rather fortunate that in the last decade the opportunities for American foresters to observe and understand forest problems of the world have been greater than ever before. They were therefore able to urge with sympathy and understanding that forestry be given its fair share in the Point Four Program.

A further factor that had an important bearing on the acceptance of the foresters' viewpoints grew out of developments in the Marshall Plan and the subsequent ECA Program. In these programs dealing largely with Central European economic problems, policy makers and planners, both in America and in Europe, were startled to find that forestry was a necessity and not a luxury. For American participants in the ECA Program, led by some of our outstanding industrialists, it was a new awakening to the

Teak logs being unloaded from a truck-tailer by means of a home-made overhead travelling pulley.

importance of forestry, This has had repercussions even in internal American policy, where we had been slowly molding an American forest policy.

The point I wish to make is that American foresters have not only had an interest in the Point Four Program, but they were given the chance to shape it in part in the preliminary stages.

Another factor that influenced American opinion and outlook regarding forestry grew out of our experience of observing the benefits that grow out of well-managed and highly industrialized forest properties, both in Europe and in some parts of our own country. We also could appreciate the consequences of mismanaged and abused forests, the effects they have on rural communities, and the corollary consequences in destructive floods and desolation. We noted this in our own country, and those of us who had the opportunity observed it in far too many places elsewhere in the world.

So it was easy for us to envisage an important part for forestry in a Point Four Program, and we hope that nothing goes amiss in achieving this objective.

The question that now requires attention deals with the manner in which such a program can be carried out positively and effectively. No one who has studied this problem has been concerned over any lack of technical skills to be mustered for the underdeveloped regions of the world. We also must assume that finances will be available in due course where justifiable plans are presented to the appropriate governments and international organizations.

The Role of FAO

We now come to a happy circumstance that has grown out of Franklin Delano Roosevelt's promotion of a Food and Agriculture Organization. It is well to re-read the charter that created this instrumentality. Even with its all too meager budget, FAO is one international organization that in five years has been able to assemble technicians in the fields of agriculture, fisheries, and forestry from practically every region of the world. It has been able, through its own personnel, to get a real understanding of the problems in these fields, to establish contacts with technicians and governments, and to assemble a substantial body of information which will prove more and more useful as time goes on.

The Division of Forestry and Forest Products in FAO has made good use of its five years. Work that it has performed for governments in underdeveloped countries has given it a rich experience in how to deal with their problems and how to assemble specialists and experts from many lands for task forces.

For forestry, therefore, it is obvious that FAO should become an important international agency in the Point Four Program. It has had good training for this task.

Those of us who have participated in FAO conferences and other of its activities and have deliberated on its programs have always been disturbed that recommendations from governments for work to be undertaken far exceeded the financial capabilities of

the Organization. The demands for new work and the expansion of activities for the forestry section of FAO have been especially heavy from countries in the underdeveloped regions. Funds, therefore, that may come from the Point Four Program may well fill this need, and profitably.

Long-Term Developments

There are a few troublesome possibilities that will have to be guarded against. There is no quick and easy cure for belated development and no short cut to rapid rehabilitation of abused forest land. Programs will take time to develop. Some of the capital investments will have deferred returns. But in such development temporary incomes may be available to indigenous populations. And in the long run productivity of lands and forests with their related industries in place should bring livelihoods to many and a source of wealth for internal and external use.

The Point Four Program cannot merely depend upon its well-wishers. A good many of the richer countries have already indicated the extent to which they will contribute to this work. It now devolves upon those countries who seek work under this plan to formulate their programs for consideration by the appropriate international agencies.

Forestry under this program may be the key project to stimulate internal industrial development in many regions. We must not, however, lose sight of the fact that the world's wood basket is none too full for growing populations under any expanding economy. The world needs productive forests for an inexhaustible array of forest products.

Requirements of a Growing Nation

By VASCONCELOS SOBRINHO
Director of the Brazilian Forest Service

THE United States of Brazil is a nation composed of Federal States with a total area of more than 8 million square kilometers stretching across South America through regions differing widely in altitude and latitude. Brazil has, in fact, as many types of vegetation as it is possible to find in any one single country.

In the north of Brazil lies the vast region of the Hiléia whose characteristics, dense forests in a hot humid climate, are well known. Adjacent to this region of solid forest is the great palm area known as Cocais, which includes the states of Maranhão, Piauí, Ceará, and Goias that make up some of the richest regions due to their enormous resources and reserves of vegetable oil.

The northeast area, comprised of seven states, Ceará, Rio Grande do Norte, Paraiba, Pernambuco, Alagoas, Sergipe, and Baía is practically covered by the extensive xerophytic vegetation known locally as Catinga. This dry region is so different from the first —the Hiléia—that it is difficult to believe two such different ecological areas exist in the same country.

Then there is the coastal forest region which resembles the Hiléia forest in many ways and which extends for more than three thousand kilometers along the Brazilian coast from the State of Paraiba to the State of São Paulo. This region is rich in timber of the best quality and supplies practically all the fuelwood for Brazilian industry which from its inception up to today has depended on wood as a main source of energy.

The next area consists of the extensive region covered by the *Araucaria* in the states of São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul. The temperate climate of this region is excellent for gymnosperms; it is here that Brazil loses the characteristics of a tropical country and takes on the aspect of a temperate country as found in Europe or North America.

Therefore, the organization of a forest service in Brazil should take into account the different ecological regions of the country, and the needs imposed by the nature of each of these regions. But, although the country is built up of ecological regions with clear and well-defined boundaries, the political divisions of the various states do not follow these same natural boundaries. The Brazilian Forest Service must therefore disregard the political divisions and consider only the various ecological regions which, as pointed out, can differ greatly from one another.

Taking into account the aforementioned considerations, the Brazilian Forest Service should be organized as follows:

- Administrative Head Office in the Federal capital with representatives in the capital of each state.
  - Research
    - Regional Research Station
      - in the Hiléia
      - in the Cocais
      - in the Catingas
      - in the Coast forests
      - in the *Araucaria* region
  - Industrialization
    - Only one set of laboratories at the Head Office
  - Development
    - Plantations for wood production
    - Plantations for soil conservation
  - Protection
    - National Parks
    - Forest Reserves

The political boundaries are only taken into consideration insofar as they require administrative representatives of the Central Administrative Head Office. However, such an extensive national department as the Forest Service must obviously work in close co-operation with the different state governments. This co-operation does not affect the basic elaboration of forest policy where the problems to be taken into consideration are the various ecological conditions of

the regions.

Industry in Brazil is still in a rather underdeveloped phase and it is necessary to intensify the study of the most advantageous and economic use of its forests. Therefore, a group of research stations and laboratories should be created as soon as possible where experts can work with all the means necessary for the study of forests with the varieties of species from widely differing regions such as are present in Brazil. The material gathered at the regional research stations should be sent to the federal headquarters, which will act as a nerve center for all studies and pass on the experience and information of proven satisfaction and use for the forests in the various regions.

Forest Industrialization

Concerning the industrial side, a section for the development of industries should be set up. This section should be created in the form of the installation of *pilot-units,* which could demonstrate to those interested the advantages of various industrial projects.

It is necessary to keep in mind that in many regions of Brazil the people are still in a somewhat backward state, and do not readily accept changes in their way of working or living. It is, therefore, a difficult and time-consuming task to train the local inhabitants in work where a complete new procedure of industrialization is taking place. In such a case the introduction of immigrants can contribute a solid base for these new industries.

The practice of importing manpower should not be considered as prejudicial to the local populations, as they will on the contrary learn from the immigrants how to improve their systems of work and standards of living. As an example, a traditional method of felling timber is cited. In some regions every species is cut down—in other words, the whole forest—whether the trees are mature or not, then the forest is left to grow until a new cut is wanted. A selective exploitation of the forest without causing complete destruction is, unfortunately, not understood.

If groups of immigrants with a good knowledge of modern methods of forest exploitation and the use of woodworking machines could be settled in forest zones, the local inhabitants would learn rapidly from them the advantages of such new methods.

In order to study all the possibilities in the vast and rich forests of this country, it will be necessary for Brazil to arrange for technical assistance from other countries who have experts in the different forest research branches. As already stated, Brazil is still in the initial phase of forest industrialization, using the most elementary techniques even in the cutting of the trees. Also Brazil does not have available experts who are sufficiently experienced to draw up plans for the existing over-all needs. Therefore it is necessary to obtain such experts from other countries where the forest industries attempt to use all the products of the forest, and the methods employed are based on experience acquired over a long time.

However, although Brazil urgently needs foreign experts to aid in plans for improving its forest industry, nevertheless, it is also in a position to supply technicians with a good knowledge of the ecological condition of the different natural forest regions. As explained above, Brazil has within its frontiers a great variety of different types of climate and phytological zones and is able to reciprocate by providing specialists who are experts in regional problems and whose services might be of value to countries which have humid tropical regions similar to the Hiléia. There are also available specialists on entirely different problems, such as those concerning arid tropical regions; their experience has been gained from studies and observations made in the vast northern part of Brazil.

In this way, Brazil is in a position to carry out an exchange of technicians on forestry problems with interested countries whose climatic and ecological conditions are the same as those found in Brazil.

In order to realize such a comprehensive program of Technical Assistance, FAO can be of great help, principally in helping to secure personnel with overall experience in the various forest industries and industrial techniques in which Brazil at present is inadequately staffed.

Technical Assistance in the Development of Tropical Forests

By A. AUBRÉVILLE
Inspector-General of Waters and Forests
Ministry of Overseas France, Paris

THE problems posed by the utilization and conservation of tropical forests are already well known, but the territories where they must be confronted are so vast and the forests themselves and the local conditions so varied that we are still a long way from finding adequate solutions. The experience accumulated in many parts of the world has at least shown what ought to be done, but a prodigious amount of time and effort will be needed before practice can catch up with theory on the scale that is required.

Tropical forestry presents much the same aspects in all countries that are sparsely populated and little developed. The difficulties may be broadly summarized as follows:

1. The forests of the tropics are extensive and on the whole little exploited. In fact, there are still great areas which are quite untouched. But where exploitation has been carried out, the output per unit of area is meager. The number of species at present marketable is small, and exports of tropical timbers

form a very small proportion of the world timber trade. This disproportion between the available resource and its utilization remains an anomaly in a world so organized that every natural resource needs to be put to work.

2. The most valuable timbers often come from those species which are the least abundant in the forest. Their extraction impoverishes the growing stock to the advantage of the less desirable trees left standing, and the first-class species are gradually ousted.

3. The practice of shifting cultivation and the attendant risk of burning and brush fires can easily completely destroy the tropical forest, particularly where it grows on steep slopes or in regions with a long dry season. The natural result of such forest denudation is soil deterioration and depletion of water supplies. But in underdeveloped areas these points are too often ignored or underestimated. Therefore, it is often a basic service to focus attention on the conditions existing in tropical areas in order to bring about full realization of their inherent dangers.

* * *

Returning to the problem of the poor utilization of the forest resource, it is fair to say that this is closely bound up with sparse populations. Where populations are more dense, necessity produces the incentive for greater forest exploitation. But as things are today, only the promise of building up an export trade will stimulate utilization in the great untouched forest regions. In my opinion, the principal use of technical assistance in such areas should be, first, to determine the proper conditions for producing an expansion of timber exports, and second, to help in achieving this expansion. Many sparsely populated tropical countries could derive considerable revenue from opening up their forest resources.

In many parts of the world the only method known for moving heavy planks is still back-breaking labor.

The main reason why tropical countries have remained backward in developing their forest resources is that so little is known of the possibilities for exploitation or of the relative value of the commodities which the forest can produce. Only a portion of the standing timber may be of commercial value as export logs or for conversion by industry, but as long as no one knows what the forest can produce, utilization cannot be developed.

What Technical Assistance Should Do

The first phase in a technical assistance program for tropical forest areas should be to investigate and assess the value of the forest resource. There are three stages to this:

1. *An estimation of the standing timber available.* The tropical forest comprises many species, in fact far too many, with varying qualities. A choice must be made of species that are likely to prove valuable in the light of the quality of wood, technological properties, relative abundance, and distribution. For each species which is considered worth exploiting, studies must be made of the timber, (physical and mechanical characteristics, uses, ease of working) and of the tree (average size, cubic content, technological characteristics of the logs, defects, grain, heartwood, etc.). Information is also required on the geographical distribution of a species and its relative abundance in the forest. A timber that is excellent but rare is not of much commercial importance unless it is especially suited for veneer.

This means that the first step should be a general inventory of the forest, beginning with the areas which are most easily accessible for exploitation, and permitting a broad evaluation to be made by region or type of forest of the average amount of exploitable timber available in cubic measure. In the course of this inventory, full investigations should be made of everything that is known locally as to the qualities and uses of the timbers found, and laboratory tests should be arranged for the study and classification of the timbers. A detailed survey of all the forests of a country would not be necessary; it would suffice to define the different forest types, and then by a process of sampling acquire adequate knowledge of the average worth of the forest.

2. *Examination of the possibilities for exploiting the forest.* This would entail a survey of the physical environment (climate, topography, soils) so as to reveal any special difficulties of extraction, and would begin with a determination of those areas which, because of good extraction routes and other means of access to the forest, can be most easily and immediately worked. Studies would cover (a) the state of existing extraction routes, e.g., the limit of navigable and floating waters throughout the year and in certain seasons, the difficulties of navigation and floating, railways and other means of transport; (b) manpower availabilities, both local and regional, with possibilities for provisioning, estimates of cost and effi-

ciency, and investigations of local working regulations; (c) determination of areas which could be opened up to exploitation after the construction of extraction routes, assessment of the railway routes available, and of the possibilities of loading logs onto ships in ports. Then a study should be made of fiscal and customs regulations in relation to their encouragement of or impediment to forest development; local and foreign markets for the timber; and local policy with regard to foreign capital.

3. *Investigation of the possibilities for setting up forest industries.* Any possibilities of this nature should be apparent from the general inventory of the forest. It is necessary that the required kinds and qualities of timber for different conversion industries should exist in quantity and that the economic conditions (cost of delivery at the mill per cubic meter, manpower, taxes, public services, markets, etc.) be favorable. It should even be possible to select those forest reserves which, because of their location, ease of working, and good stocking, could readily furnish sustained supplies to new mills.

A second phase. It is possible that in a second phase technical assistance could be rendered in the actual setting up of mills and in finding the necessary capital investment. But this would of course depend on whether the reports and studies of the technicians revealed all the necessary conditions to be satisfactory.

After having estimated the forest resource and examined the ways of utilizing the timber available, technical assistance experts should recommend appropriate methods of exploitation and the equipment which they consider best suited to the local conditions. In the case of easily accessible forests, the question of their permanent management should also be given consideration, with a view to carrying out exploitation as nearly as possible on sustained-yield principles and avoiding impoverishment of the growing stock.

Forest Conservation

Technical assistance should not be limited to determining the best means of developing forest exploitation. Attention must be paid to means for preserving the forest capital from destruction and also to the possibilities for increasing it for the benefit of future generations. Too often forest utilization merely consists of exploiting the forest capital that has accumulated up to the time the fellers move in. The choice trees and the best timbers are taken out with no regard for regeneration or the future of the forest. It is easy to appreciate that it is often impossible to do anything else; the timber man can only exploit those timbers which he is sure of marketing, and it is not his job to be concerned over the future of the forest. That is the responsibility of the public services which must carry out the measures necessary to compensate for any depletion of the growing stock. They should, if they are well advised, undertake silvicultural operations suited to the species concerned and the forest conditions. They should devote part of the revenue derived from exploitation to forest improvement, so as to create a more valuable crop which might one day be of benefit to the country as a whole.

In French territories of tropical Africa we have come to realize that the exploitation of the most valuable species such as mahogany, iroko, okoumé, etc., has not been balanced by natural regeneration of these

Rather than traditional animal power—

species, so that the forest has become impoverished. In fact, the exploitation of certain species will soon be at an end, because there will be no trees to exploit. Without proper silvicultural treatment, commercial exploitation of the tropical forest could not last long. It has often been said that the tropical forest is poor forest. This is true, but with proper silviculture the environment could support rich forests. This consideration must not be overlooked. Any modern state that does not strive to improve its forest wealth will some day have to reconstitute its forests, and it will find the delay a costly one.

Silvicultural Methods

For some time foresters in Africa have been studying the ecological requirements of selected species and the best conditions for securing their regeneration by natural or artificial means. Natural regeneration is

large-scale forest development often demands machines.

best suited for shade-bearing species, which often occur in stands that are homogenous or nearly so and which can successfully regenerate themselves in the shaded understory. For the light-demanding types such as okoumé and limba, which are both valuable species, plants or seeds are set out in wide clearings in the forest. For other species young seedlings from nurseries are planted in narrow parallel clearings in the forest. Circumstances dictate whether intensive or extensive methods are best employed, but the aim is always to secure the best results at the least cost. As often as possible recourse is had to *taungya*[1] operations, whereby valuable trees are established in the clearings used for cultivation by the local populations.

The ways to investigate the reconstitution and improvement of the forest are simple and straightforward: First, direct observation in the forest to study the characteristics of the trees; then, the creation of an arboretum and of silvicultural experiment stations. Planting programs must be drawn up taking account of the results of both the observations and the experiments.

Problems of Deforestation

The danger of forest destruction cannot be overemphasized. It is a common problem and a difficult one, because it involves traditional local customs. Since attempts to control these practices usually encounter social and political complications, it is unlikely that deforestation can be halted immediately by law. It is still necessary, however, to attempt to open the eyes of all the inhabitants, particularly national leaders, to the dangers to the future prosperity of their country. Before such an educational program can be carried out a thorough study must be made of the local conditions and practices that lead to forest destruction and of the means of arresting it. In my opinion, technical assistance experts have an important role to play in work of this kind.

In tropical French African territories attempts are made to set limits to excessive forest destruction by allocating certain parts of the forest to the various communities, thereby limiting the area which can be subjected to clearing, enabling fire protection to be introduced, and assuring at least a minimum of control over the populations practicing shifting cultivation. This procedure requires the making of maps and the carrying out of forest surveys—tasks which are among the fundamental jobs of forest services. This is a minimum type of forest protection which can readily be adopted in all tropical countries. In Africa many millions of hectares have been delimited, but the work is still far from being finished. Today, mapping and classification can be speeded up considerably with aerial surveys and photography.

Training of Forest Staffs

The training of forest staffs, both governmental and private, is another field in which technical assistance can be valuable; no improvements can be made until there are men trained to carry them out. Technical assistance can take several forms: First, advanced training for existing personnel through collaboration with experts in the field; secondly, organization of specialized training abroad, when local facilities do not exist; and finally, direct participation in, or at least advice on, the creation of forestry schools to train complete staffs—senior officers and rangers and forest guards.

* * *

The ways in which technical assistance can help underdeveloped tropical countries are many. Experts can undertake general forest inventories and economic and silvicultural studies. Sometimes they can advise on the actual establishment of a silvicultural experiment station, determine the correct techniques for exploitation and forest industries, select forest areas to be protected or exploited under satisfactory safeguards, or arrange for the training of professional staffs. Still further technical assistance can be rendered through direct participation in programs for the development of utilization and conservation of forests, if a country so requests; for example, by carrying out the necessary research on timbers in laboratories, initiating forest management plans, organizing study courses abroad, or by creating and helping to run national forestry schools. Lastly, as I see it, technical assistance can lay the groundwork for the eventual entry of foreign capital for the installation of forest industries.

How technical assistance will actually function in practice is not easy to foretell. Missions of experts visiting a country for a short period can produce significant reports, but their efforts are necessarily limited to their recommendations which may or may not be acted upon. For technical assistance really to have any lasting effect, a mission should stay in a country for several years, and it should consist not only of foreign specialists but also of nationals of the recipient country who will form the nucleus for the future organization, direction, and execution of technical assistance programs. The over-all direction should lie with the most qualified expert, who will lay down the general directives, organize and control the work, and assess the results and the experience gained, but the mission must work in close liaison with the appropriate local services and with their full support, for without such collaboration I doubt that any really useful result would be forthcoming. Finally, a mission must be provided with all the necessary funds, transport, personnel, and research facilities, if it is to do the job before it.

The activities of technical assistance missions fall into several stages, the preparatory phase being of prime importance. The general survey is fundamental; its purpose is to sort out the problems, assess their relative importance, and outline the difficulties of the task ahead. Only then can the plan of work be elaborated.

Photographs by courtesy of: British Information Service (p. 149); Forest Research Institute, Dehra Dun, India (p. 150); Allis-Chalmers Company (p. 157, lower); the Netherlands Information Bureau (p. 157, upper); Hyster Company (p. 160); U. S. Forest Service (p. 161); Fitchburg Engineering Corporation (p. 162).

[1] Planting and tending of tree species at the time the crops are cultivated. When the crops have been harvested, the trees remain to grow into high forest.

FAO and Technical Assistance

By the FAO SECRETARIAT

FAO's expanded program of technical assistance to underdeveloped areas of the world began in September 1950 with the execution of formal technical assistance agreements between the Food and Agriculture Organization of the United Nations and the governments of Burma, Guatemala, and Saudi Arabia.

The program is made possible by the special Technical Assistance Fund contributed by member states of the United Nations and of the specialized agencies. FAO has been allocated the greatest proportion of the monies paid into this Fund, namely 29 percent, and therefore has great responsibility for spending these sums to the best advantage. It should be noted that the contributions of participating governments are made in national currencies and are subject to the normal conversion restrictions when used to pay for personnel or services provided by the United Nations to recipient countries.

The history of the expanded program of technical assistance has been given in an earlier article by the Executive Secretary of the United Nations Technical Assistance Board. Within FAO, preparations for full and active participation in the program have for the past year been the personal concern of the Director-General, advised by the directors of the various divisions. Administrative and technical matters have been checked and co-ordinated by an interdivisional working group, each member of which is responsible for all general technical assistance activities within his division.

Dr. F. T. Wahlen, Chief of FAO's Expanded Technical Assistance Program, is responsible for ensuring that the relevant recommendations of the FAO Conference and Council regarding the new program are implemented; for supervising and co-ordinating the specific technical activities undertaken by FAO under that program; and for advising the Director-General on all policy issues. He also is responsible for co-ordinating arrangements dealing with the financial and administrative problems that arise out of the operation of the new program, and for co-ordinating the briefing of field personnel and the supervision of missions in the field.

To guide agencies in extending technical assistance to underdeveloped countries, certain principles have been laid down by the General Assembly of the United Nations. These are:

1. Regard it as a primary objective to help those countries to strengthen their national economies through the development of their industries and agriculture with a view to promoting their economic and political independence in the spirit of the Charter of the United Nations and to ensure the attainment of higher levels of economic and social welfare for their entire populations;

2. Observe the following general principles laid down in General Assembly Resolution 200 (III):

(a) Technical assistance for economic development of under-developed countries shall be rendered by the participating organizations only in agreement with the Governments concerned and on the basis of requests received from them;

(b) The kinds of services to be rendered to each country shall be decided by the Government concerned;

(c) The countries desiring assistance should perform, in advance, as much of the work as possible in order to define the nature and scope of the problem involved;

(d) The technical assistance furnished shall: (i) not be a means of foreign economic and political interference in the internal affairs of the country concerned and not be accompanied by any considerations of a political nature; (ii) be given only to or through Governments; (iii) be designed to meet the needs of the country concerned; and (iv) be provided as far as possible in the form which that country desires;

3. Avoid distinctions arising from the political structure of the country requesting assistance, or from the race or religion of its population.

At the same time Governments requesting assistance are expected to agree to certain obligations. It may therefore be of interest here to quote verbatim from the annex of the relevant Economic and Social Council resolution:

The requesting Governments should be expected to agree:

1. To facilitate the activities requested from the participating organizations by assisting them to obtain the necessary information about the problems on which they have been asked to help, such information to be limited strictly to questions directly related to the concrete requests for technical assistance; and, whenever appropriate, facilitate their contacts with individuals and groups, in addition to Government agencies, concerned with the same or related problems;

2. To give full and prompt consideration to the technical advice they receive as a result of their co-operation with the participating organizations in response to the requests they have initiated;

3. To undertake to maintain or set up as soon as practicable such governmental co-ordination machinery as may be needed to ensure that their own technical, natural and financial resources are mobilized, canalized and utilized in the interest of economic development designed to improve the standard of living of their peoples and through which the effective use of any major international technical assistance resources could be assured.

4. Normally to assume responsibility for a substantial part of the costs of technical services with which they are provided, at least that part which can be paid in their own currencies;

5. To undertake the sustained efforts required for economic development, including continuing support and progressive assumption of financial responsibility for the administration of projects initiated at their request under international auspices;

6. To publish information or provide for study and analysis material suitable for publication regarding the results of the technical assistance rendered and the experience derived therefrom, so that it may be of value to other countries and to the international organizations rendering technical assistance;

7. To inform the participating organizations, whenever technical assistance is requested, of all assistance which they are already receiving or requesting from other sources in the same field of development;

8. To give publicity to the programme within their countries.

The expanded program, it must be remembered, is one for economic development. As in any national program for economic development, increased services undertaken by a government can be maintained, in the long run, only out of national production, and therefore the Economic and Social Council has suggested that, under the technical assistance program, "special attention needs to be given in timing and emphasis to activities tending to bring an early increase in national productivity of material and human resources."

The function of technical assistance is to furnish the advice which will enable governments to accomplish tasks themselves. This advice, in addition to its intrinsic value, may indeed constitute a positive aid toward the acquisition of other means, such as financial investment and physical equipment. Specific requests for the furnishing of equipment and supplies are considered only in so far as they form an integral part of a larger project of advisory assistance.

Inquiries.

The elaboration of a technical assistance project must pass through several phases. The kinds of technical assistance which FAO could render were described in a United Nations report published in 1949 entitled *Technical Assistance: Expanded Co-operative Programme.* Further series of examples of possible projects suitable for early initiation were later prepared for use by the Director-General's representatives in discussions with national authorities. Such personal discussions were carried on over a wide field during the summer of 1950, and resulted in a number of preliminary requests to FAO in the form of letters of inquiry, giving a broad indication of what a government is doing or proposes to do for the economic development of its country, especially in terms of committing its own personnel and funds, and setting out the kinds of special assistance it would require, and what other approaches it had made or intended to make to other agencies or governments for assistance in the same field.

In many countries there is still some degree of uncertainty as to the best way in which international organizations such as FAO can furnish help. It is hoped that such countries will call upon the regional staff members of FAO to help in the formulation of technical assistance programs. These officers can also render useful advice in making a priority selection from among the projects which a government may wish to submit.

Requests

On the basis of letters of inquiry and following further consultations in the field or by post, a formal request to FAO is drawn up by a government requiring technical assistance.

In principle, it is hoped that technical assistance in the field of forestry and forest products will only be requested for specific projects included in a comprehensive forestry program which is itself based upon a complete knowledge of the resources of a country, i.e., upon an inventory of the forest resource and a statement of the country's forest policy. However, it is recognized that many countries do not have such an inventory on which to base consistent programs of work and an over-all forest policy.

Under these circumstances, it is hoped that the initial formal request to FAO will be for assistance in drawing up inventories and formulating a comprehensive forest policy. This may appear to be a somewhat abstract approach, but the procedure involved can be speeded up without any detrimental effect. Granted that too general an approach, implying the application of purely administrative measures, may disappoint governments that expect immediate practical achievements, fundamental general surveys can be made acceptable by incorporating into them some specific projects which have been thoroughly examined both by the national technicians and by staff members of FAO.

A distinction may be drawn here between two types of countries that may call for technical assistance: those which already have well established forest services, and those which as yet have none or only skeleton staffs.

Those with proper staffs have technicians who are thoroughly acquainted with their own countries and their potentialities and who are fully competent to select projects in which United Nations assistance can truly be of value.

These technicians are also in a

Some countries need to be introduced to efficient modern equipment for saving costs.

position to know to what extent their governments are able and willing to proceed with projects which they may request, fully appreciating that it is most unwise to embark even on the preliminary investigation of projects unless there is a reasonable chance of obtaining funds to carry the whole thing through.

It must be kept in mind that one of the main difficulties in carrying out a technical assistance program may be the lack of a sufficient number of skilled technicians within the country itself. The most valuable service to such countries may then consist of helping to train specialized personnel rather than directly initiating individual development projects. This help may take the form of traveling fellowships or scholarships for technicians to be trained abroad, provided this training is directly related to the country's economic development program. A vital aspect of the task of international experts furnishing assistance requested on any particular project will also, of course, be the local training of personnel to take over from them.

As for those countries which have as yet no forest staffs, it is hoped that they will first request assistance in organizing a forest service, training technicians, and formulating a general forest policy and program of work.

Agreements

A formal request to FAO for technical assistance may be directly approved by the Director-General or, under certain circumstances where several international agencies are involved, be referred to the United Nations Technical Assistance Board. Wherever the nature of the requested assistance suggests it, every effort will be made to co-ordinate technical assistance programs on a regional scale.

Execution

Once a formal request and all the supporting administrative and budgetary data have been approved, a standard agreement is signed between the Director-General of FAO and a representative of the government concerned. The first step thereafter is the selection of experts to go to the country in question. In choosing foreign experts, it is considered essential to select individuals of the highest professional competence who have a sympathetic understanding of the cultural background and specific needs of the country to be assisted, and a capacity to adapt methods of work to local conditions, both social and material.

The experts must be ready and willing to do field work, even under difficult conditions, and theoretical work or scientific research must often come later. In many instances specialization in tropical forestry will be essential.

Modern machines, in this case helicopters, can be put to a variety of economical uses, from inventorying to fire protection.

With regard to the recruitment of such technicians, there is no panel of experts just waiting to be called on. Each project involves hunting for the experts wanted, and they are hard to find. Lists of available experts have been compiled by FAO from names submitted by governments, technical institutions, or on private recommendation. Some of these experts are willing to serve only for short periods, others only for periods of a year or longer. The selection for any one project is therefore no easy matter.*

Once selected, the United Nations will expect its experts to collaborate closely with local technicians. These international experts will need the advice of their local colleagues, must associate with them in their work, and later must rely upon them to implement the measures recommended.

Control

Under the new program numerous missions, frequently with similar purposes and composed of necessarily small teams of qualified experts, will be sent out to work in several countries. This alone raises many administrative difficulties, and the whole undertaking has to be organized very carefully.

Control from headquarters will be so exercised as to permit the maximum freedom of action for missions and allow flexibility in the general program. As far as possible, regional offices will be called upon to brief experts on broad policy as well as on the technical

*Experts are paid according to uniform salary scales, receive travel and subsistence allowances, and are entitled to certain other privileges, depending on the circumstances in each case.

aspects of their assignments, to supervise the general progress of particular projects, and to assist the experts in their work, especially when they are ready to write up their conclusions. Headquarters will be responsible for drawing up the official FAO reports on the whole progress of the program to the United Nations Technical Assistance Board and the Technical Assistance Committee of the Economic and Social Council.

Results of Technical Assistance

The practical realization of a technical assistance program, that is, the carrying out of the recommendations and execution of the projects planned by the experts, will bring many problems to the fore. True, the implementation of projects is incumbent upon the governments and upon them alone. Nevertheless, technical assistance furnished by the United Nations and its agencies should not be considered as a sporadic effort. It is rather an opportunity for particularly effective action, using extraordinary ways and means, which must be integrated into a long-term, worldwide program of work.

FAO will therefore continue to provide direct technical aid to governments at their request as a part of its regular program of work, although the extent of this aid will necessarily be limited by the size of the regular budget and by the demands on that budget of other activities which member governments expect FAO to perform. Some of the technical aid extended under the regular budget will probably lay the basis for further work under the expanded program, as in the case of the FAO Missions to Austria and Nicaragua earlier this year. Other FAO activities carried on under the regular budget will be related to follow-up work of technical assistance already undertaken under the expanded program. As far as possible, however, the new program will operate as a separate self-contained undertaking. The administrative and overhead costs will be kept as low as possible so that the contributions of countries to the special fund can be used to the maximum extent in the direct provision of technical assistance to the recipient countries.

Not so long ago Point Four was not a program but rather a state of mind. Now its proposals are beginning to be fused into a workable design. But technical assistance alone is limited in its achievements. There must also be self-help, as was pointed out in the final report of the recent United Nations Economic Survey Mission for the Middle East:

"Technical and scientific knowledge can contribute to increasing material standards of living in underdeveloped areas. The better use of water and land, the control and eradication of disease and pests, an increased manufacture and flow of goods and the spread of education, require the application of what man knows or can find out about the productive capacity of men and things.

"But higher living standards cannot be bestowed by one upon another like a gift. An improved economy does not come in a neat package sold or given away in the market place. A higher standard of living must grow out of the application of human skill and ingenuity to the physical resources of a country or a region.

"The highly developed nations of the world did not make their way by wishing. By work and risk they forced the earth, the soil, the forests and the rivers to yield them riches. They pooled their energy and resources by taxation and mutual enterprise to discover new ways of doing things. They worked, they invented, they educated and trained their children, and they invested in their national and in their private enterprises. This they must continue to do, if they are to maintain the standard of living they have achieved.

"There is no substitute for the application of work and local enterprise to each country's own resources. Help to those who have the will to help themselves should be the primary policy guiding and restraining the desire of the more developed areas of the world to help the less developed lands."

A simple portable wood chipper mounted on a jeep may make small woodlots profitable.

Commodity Report

Hardwoods

THE multiplicity of uses and requirements for hardwoods do not lend themselves to easy classification; the trade tends to be highly specialized; and comparable international statistics are difficult to assemble.

For industrial use, hardwoods are far less favored as general utility timbers than softwoods, even in countries where softwoods have to be imported. In rural areas, especially in tropical countries, hardwoods commonly make up the bulk of domestic consumption.

Since time immemorial, hardwood timber has been used for a variety of purposes ranging from housing construction and ship-building to furniture manufacture and artistic carvings. In modern times, hardwoods have proved a valuable raw material for such products as railway sleepers, pitprops, telegraph and telephone poles; the bodies of certain types of railway cars and automobiles, etc.; as well as for more processed wood products, such as plywood and laminboard, and, lately, wood pulp.

Traditionally, the number of hardwood species current in trade has been relatively small, although considerably greater than that of softwoods. In recent years, particularly during the period of general timber shortage, increasing attention has been given to hardwood species which had been more or less unknown or regarded as lower quality timber.

The trend is towards increased rational utilization of wood, and the postwar import figures show a big reduction in shipments of logs for conversion to sawn timber or lumber. Logs continue to be shipped for veneer and plywood industries, but in general exports tend increasingly to consist of sawn timber of standardized dimensions and qualities. The reduction of consumption seems to have mainly affected the medium and lower grades of hardwoods; the demand for higher qualities and larger dimensions continues.

The main feature of the present situation seems to be a decrease in use of solid timber in the building and furniture industries. Requirements for railroads and shipbuilding generally remain firm. There is increasing emphasis on the manufacture and use of veneers and plywoods, including moisture-resistant plywood, laminated wood, and modified wood, as well as on prefabrication, standardization, and the establishment of structural grades for use in design and for inclusion in building codes.

Through improved seasoning practices, including kiln drying, and the use of preservatives secondary and nondurable hardwoods may replace softwoods in some uses. Many more tropical timbers could gain wide markets, if there were more knowledge as to how they can be worked, by the provision of quality and delivery guarantees, by the reduction of freight rates and export and import duties, by the setting up of better systems for grading logs according to recognizable characteristics, and if costs were reduced by such measures as the introduction of mechanization. A great hope in the hardwoods field seems to lie in new pulping processes for transforming low-quality woods and wood waste or residues into many kinds of pulp and paper. Important progress has been achieved in this respect during the last decade in many countries in both the Northern and the Southern Hemispheres.

In Europe and North America, the export trade in hardwoods is only 2 to 5 percent of output; relatively few species are involved (principally oak, beech, ash, poplar, birch, walnut, and maple), but there is a wide variety of qualities owing to local growing conditions. It is the tropical regions of Africa, Latin America, and Asia on which the industrialized countries of the world mainly depend for their import supplies of specialty woods, and in these areas hardwood exports may be as high as 30 percent of output. Mahoganies from Africa (*Khaya* spp.) or the Americas (*Swietenia* spp.), okoumé (*Aucoumea klaineana*) and limba (*Terminalia superba*) from West Africa, teak (*Tectona grandis*) from Burma, Thailand, and Indonesia, dipterocarps from the Philippines and Malaya, greenheart (*Ocotea rodioei*) and cedar (*Cedrela* spp.) from Central and South America, balsa (*Ochroma grandiflora*) from Ecuador, rosewood (*Dalbergia* spp.) from Brazil, are a random sampling of the types of timber traded internationally.

International trade in hardwoods is considerably below prewar levels. It is likely to increase in the near future, but not to any great extent, as the volume of supplies at hand is not expected to augment very rapidly.

The European demand, only partly met by supplies from within the continent, is expected to continue to be filled by larger quantities of exotic hardwoods. It is improbable that hardwood imports from North

America will increase very much in 1951.

North American imports of specialty hardwoods are likely to continue, although perhaps at somewhat lower levels if the recent trend towards building restrictions continues.

Under present conditions, if the world demand for hardwoods remains relatively unchanged, it appears that the position of the hardwood exporting countries of Latin America will be strengthened.

The role of African hardwoods in international trade has become more and more important after the recessions of the war period. It is expected that this trend, aided by methodical improvement of exploitation, utilization, and grading, will continue in 1951. Exports of African hardwoods have proved a valuable source of dollar earnings, too.

In the Far East, political unrest in some hardwood exporting countries has partly upset plans to increase production and exports. If conditions in that region should become more peaceful, considerable increases in hardwood exports could be anticipated in 1951 and 1952, as most of the importers are very active in building up inventories.

In 1949, the trade picture shows a slight decrease in imports of sawlogs and veneer logs into Europe and a sizable decrease in the United States import and export trade in hardwoods, as compared with the preceding year. Total exports of hardwoods from Canada and certain South American countries also declined. As there is no official information available for a great number of important exporters in Africa and Asia, no definite conclusions can yet be drawn as to the volume of world trade in 1949.

Europe

Since 1937, the European hardwood trade has undergone changes similar to those in the softwood market, though perhaps more fundamental. There has been a marked reduction in consumption of sawn lumber, particularly of lower grade material, and increasing consumption of hardwood by the plywood and veneer industries and by manufacturers of laminated structures and modified wood.

Production

Prior to World War II Eastern and Central European countries, particularly Poland, Czechoslovakia, Yugoslavia, and Romania, were the main hardwood exporters. In Western Europe, only France was of importance as a hardwood supplier. Finland and Sweden provide considerable amounts of birch.

The supplies from Central and Eastern Europe appear to have been obtained by overcutting the forests.

Czechoslovakia, *Romania*, and *Poland* have not been as important exporters of hardwoods to Western Europe since the war: production capacity is less; areas in Czechoslovakia and Poland containing important hardwood forests have been ceded to the U.S.S.R.; domestic demand in these three countries has considerably increased; and there is a decided trend to export finished products rather than rough timber, either round or sawn.

Romania may serve as an example of the changed situation. Production of roundwood which amounted to 1,250,000 m^3(r) prewar was supposed to reach only 363,000 m^3(r) according to the 1948 program, while output of sawn wood was planned at 160,000 m^3(s) for 1948.

In *Yugoslavia* the forest potential also suffered greatly from overcutting. However, Yugoslavia, next to France, will probably remain the most important European exporter of sawn hardwood.

In *France* the 1949 production of hardwood sawlogs and veneer logs is estimated at a total of 3,300,000 m^3(r) solid volume under bark. Prior to the war, France regularly exported hardwood logs to Belgium, the Netherlands, Switzerland, and the United Kingdom, and this trade has continued. At the same time, the French hardwood market absorbs more and more timber from France's overseas territories.

Over-all hardwood production in Europe is not likely to increase to any important extent during the next few years. This assumption particularly applies to the production of large diameter logs of prime quality for plywood and veneer manufacture. It will take 10 to 20 years before the extensive poplar plantations, which have been greatly increased during the past years, will be able to contribute substantially to the European hardwood supply.

The European hardwood market will therefore be increasingly dependent on imports from overseas for timber in dimensions not available or only partly available in Europe, and especially for veneer and plywood qualities. Tropical forests are the natural sources of supply for many of these requirements.

Exports

Total hardwood exports (sawn wood, and roundwood converted to sawn)* of the main European exporting countries amounted to about 1 250.000 m^3 in 1937. They dropped to 550.000 m^3 in 1948 (including Bizone Germany) and rose to only 700,000 m^3 in 1949.

More striking even than the reduction of total European hardwood exports is the reduction of hardwood exports from Central and Eastern European countries, particularly from Czechoslovakia, Poland, and Romania. While these countries exported roughly 680,000 m^3 (sawn wood equivalents) in 1937, their exports dropped to about 43,000 m^3 in 1949, or to roughly 7 percent of prewar exports. The main reasons for this severe reduction of exports have already been mentioned.

Yugoslavia, which in 1937 was the largest European hardwood exporter, exported almost an equivalent of its prewar volume during 1949. It is interesting to nonte that in 1949 Yugoslavia exported 362,000 m^3 (r) of hardwood pulpwood to Italy.

Another source of supply which is of certain importance to the postwar Western European market is *France;* in 1948 *Germany* was also an important supplier. Hardwood exports from these two countries in 1949 represented a slight increase over 1937 exports.

The *Northern European countries* which export exclusively birch logs and birch sawn wood for special purposes are a third European source of supply. Exports from these countries have fallen to roughly one-half of prewar volume.

*Roundwood units have been converted to sawn wood equivalents on the basis of 1 cubic meter of roundwood (m^3(r)) = 0.600 cubic meter of sawn wood (m^3(s)).

Generally speaking it appears unlikely that total European hardwood exports can be increased in the near future.

Imports

Total imports (sawn wood plus sawn wood equivalent of logs) have fallen from 2,700,000 m³ in 1937 to about 1,600,000 m³ in 1948 and roughly 1,800,000 m³ in 1949.

Postwar imports into *Germany* show the greatest reduction. While Germany imported about 470,000 m³ in 1937, its imports in 1949 amounted to no more than 35,000 m³ (sawn wood equivalents). It is expected that Germany will again become an importer of hardwoods on a large scale.

A severe reduction of imports also occurred in the *United Kingdom* which imported 1,500,000 m³ in 1937 and only 870,000 m³ (sawn wood equivalents) in 1949.

TRADE IN HARDWOODS

Country	Sawn and planed lumber				Sawlogs and veneer logs			
	Exports		Imports		Exports		Imports	
	1948	1949	1948	1949	1948	1949	1948	1949
	(1,000 m³(s))				(1,000 m³(r))			
EUROPE								
Belgium	6	10	60	58	24	38	80	84
Czechoslovakia	18	...	9	...	1	...	32	...
Denmark	2	...	7	5	...	...	26	25
Finland	25	13	*	2	10	32	3	2
France	104	184	36	27	130	178	162	250
Germany: Bizone	2	*	1	4	127	...	9	50
Ireland	*	*	12	13	*	1	1	3
Italy	8	6	62	46	*	1	16	[4]89
Netherlands	—	1	93	63	1	1	174	114
Norway	...	...	20	22	—	*	—	—
Poland	...	...	12	...	...	...	3	...
Portugal	*	*	5	...	1	*	15	19
Sweden	5	6	26	16	*	2	34	17
Switzerland	*	1	56	35	1	3	81	52
United Kingdom	*	*	552	663	*	*	452	347
Yugoslavia	209	283	—	—	52	46	—	—
NORTH AMERICA								
Canada	472	260	56	104	113	119	—	—
United States	207	187	512	325	140	121	462	254
LATIN AMERICA								
Brazil	48	31	...	...	[2]110	[2]76	2	·
British Guiana	16	15	—	—	[3]16	[2]15	2	4
British Honduras	14	...	1	...	15	...	—	...
Chile	55	82	-	-	...	...	...	...
Costa Rica	*	...	...	...	30	...	...	...
Cuba	...	...	35	...	...	...	*	...
Honduras	13	14	—	—	—	—		
Nicaragua	3	...	...	...	...	19	...	...
Surinam	1	2	—	—	30	15	—	4
Uruguay	-	—	—	...	...	...	33	...
AFRICA								
Belgian Congo	22	...	*	...	60	...	9	...
French Cameroons	10	...	...	...	55	...	...	...
Fr. Eq. Africa	19	...	...	...	295	326	...	...
Fr. West Africa	—	...	37	...	98	...	...	...
Gold Coast	24	39	...	...	177	174	...	...
Nigeria	15	...	...	...	91	...	...	...
Southern Rhodesia	3	3	18	21	13	13	4	5
Uganda	10	6	*	*	1	1	...	...
ASIA								
Burma	154	116	—	...	4	...	—	—
Hong Kong	1	8	22	43	...	—	52	40
India	3	1	89	49	...	...	—	—
Indonesia	...	...	8	8	[4]17	[4]138	—	—
Japan	17	37	—	5	...	...	12	50
Malaya	48	94	2	4	1	3	43	69
Philippines	34	...	*	...	70	...	...	...
Thailand	91	...	—	...	17	...	...	...
North Borneo	5	7	*	2	113	119	...	...
Sarawak	...	...	...	...	[5]28	[5]55	...	...
OCEANIA								
Australia	45	57	7	14	20	24	88	121
New Zealand	3	3	13	22	—	—	1	...

. . Not available.
—None.
*Less than 500 m³.
[1]May include considerable quantities of pulpwood.
[2]Includes poles, piling, and posts.
[3]Includes poles, piling, and posts which in 1948 totaled 11,000 m³(r).
[4]Includes other roundwood (except fuelwood), hardwood lumber, and sleepers.
[5]Includes hardwood lumber.

During the first half year of 1950, imports to the United Kingdom showed a considerable increase as compared to 1949.

Only *Italy* showed larger imports of hardwood during 1949 than in 1937.

It is interesting to compare import developments of hardwood logs and sawn hardwood in Europe. During 1949 imports of sawlogs amounted to 1,500,000 m^3(r), approximately the prewar imports average, while imports of sawn hardwood were only 950,000 m^3(s) or about 50 percent of the 1937 level of close to 2,000,000 m^3(s).

Imports from European sources have declined from prewar levels; imports from other areas, however, show substantial increases in some European countries

The hardwood market has been affected by currency problems. While imports from Yugoslavia, France, and the Northern European countries have been covered by clearing or barter agreements, and exotic timbers have been imported mainly from French, Belgian ,and United Kingdom territories, imports from the dollar area have been diminishing.

The fact that the European hardwood market appeared to be relaxed in spite of greatly reduced total imports and an abundance of lesser quality woods seems to indicate that consumption has been able to adjust itself to the new supply situation by falling back on substitutes.

Prices

Developments on the European hardwood market have been characterized by large price increases. Comparison of 1937 and postwar prices is made difficult by the fact that sorting underwent some changes during that period. The following figures, therefore, can only be interpreted as average.

HARDWOOD PRICES: 1949 COMPARED WITH 1937

	Sawn timber	Roundwood
	(*Index: 1937 = 100*)	
Oak I quality	250	300
Oak II quality	200	200
Beech I quality	220	250
Beech II quality	165	180

AFRICA

Nigeria. Before the war, Nigeria exported only "luxury woods" and principally mahogany (*Khaya* spp.). Of late years, however, there has been a good market for other species also. In 1949, there is reported to have been a considerable increase in Nigerian timber exports, the United Kingdom being the principal market. This increase was partially attributable to a dock strike in the Gold Coast which curtailed additional supplies from that source. Also, a new voluntary timber inspection scheme has increased the confidence of importers in the quality of Nigerian timber.

Gold Coast. Until recently, timber production in the Gold Coast has been dominated by mahogany, but here too there is a marked swing to other species, and total output has been increasing. Production of sawn wood was 31,000 m^3(s) in 1948 and 77,000 m^3 in 1949.

Exports of logs from the Gold Coast reached a new record of 177,000 m^3(r) in 1948, mahogany constituting nearly 63 percent of the total. Sawn wood exports in that year totaled 24,000 m^3(s) and rose to 39,000 m^3(s) the following year. The main customers for timber from the Gold Coast are the United Kingdom and the United States of America.

Belgian Congo. Timber output in the Belgian Congo in 1947 included 350,000 m^3(r) of hardwood sawlogs and veneer logs. During the same year production of sawn wood totaled 225,000 m^3(s), of which some 200,000 m^3(s) were consumed in the country. Later figures on production are not available.

Exports from the Belgian Congo appear to be diminishing. Sawn wood exports were 37,000 m^3(s) in 1947 and 22,000 m^3(s) in 1948. In the same period. total timber exports dropped from around 100,000 tons to about 78,000 tons. This trend continued during the first quarter of 1949.

French Africa. In prewar years the French African territories were important centers for the production and export of hardwood timber. The main sources of supply, Gabon, Middle Congo, Ivory Coast, and the mandated territory of French Cameroons, exported an aggregate quantity of roughly 450,000 tons a year. Demand began to weaken before the outbreak of war; subsequently, shipping difficulties and problems of finding manpower kept trade at a low level. By 1948 exports were running at about one-half of the 1937 figure: 73,000 tons from the Ivory Coast, about 60,000 tons from French Cameroons, and about 200,000 tons from French Equatorial Africa (Gabon and Middle Congo). About 57 percent of the aggregate exports went to France, about 41 percent to foreign countries, and the balance to French dependencies.

In 1949, exports from French Equatorial Africa, consisting mainly of okoumé (*Aucoumea klaineana*) logs, totaled 326,000 m^3(r), of which about 44 percent went to France, some 25 percent to the United Kingdom, and 9 percent to Germany. Exports from French West Africa were estimated at 225,000 tons, including 150,000 tons of logs. Acajou (*Khaya ivorensis* and *anthotheca*) made up 60 percent of sawn wood exports. There were signs of mounting obstacles in marketing tropical timbers overseas, because of high prices and payment difficulties. However, demand for okoumé timber continued strong irrespective of prices. Okoumé is becoming increasingly scarce in the more accessible forest areas, and it is doubtful whether output can be kept at the best prewar levels of 300,000 to 400,000 tons per year. As the big plywood and veneer plants already existing or under construction in French Equatorial Africa and on the Ivory Coast will require a considerable quantity of logs, exports of okoumé for European industries are likely to become difficult, and some substitutes such as limba (*Terminalia superba*) and kombo (*Pycnanthus kombo*) may be introduced. Estimates of exports in 1950 and in 1951 are as follows:

	Logs and rough timber	Sawn wood	Veneer and plywood
	(*1,000 m.t.*)	(*1,000 m^3*)	(*1,000 m^3*)
Ivory Coast	70-75	10-15	5
French Cameroons	55-60	70-80	—
Gabon and Middle Congo	180-185	10-12	30

The main portion of these exports would be absorbed by France, North Africa, and the deficit regions of West Africa.

Portuguese territories in West and East Africa ship some hardwoods to Europe and to the Union of South Africa. *Southern Rhodesia* is on balance an importer of logs and sawn wood. Important trade developments are looked for in some of the non-self-governing territories of *East Africa.*

North America

*Canada.** Output of hardwoods in Canada represents only 10 percent or less of the total output of timber. Output of hardwood sawlogs and veneer logs was 3.6 million m^3(r) in 1947, 2 million m^3(r) in 1948, and an estimated 3.2 million m^3(r) in 1949. Production of sawn hardwood declined from 1,827,000 m^3(s) in 1947 to 1,387,000 m^3(s) in 1948, and further to 1,341,000 m^3(s) in 1949. Preliminary reports indicate that output of hardwood lumber and railway sleepers during the first half of 1950 was about 20 percent below the corresponding figure in 1949.

Canada's exports of sawn hardwood amount to less than one-tenth of the total lumber exports, and consist mainly of birch and maple which may account for three-quarters of all sawn hardwood exports. These exports (including hardwood flooring) have also been declining during the past three years: they dropped from 562,000 m^3 (s) in 1947 to 472,000 m^3(s) in 1948 and to 260,000 m^3(s) in 1949. The main part of these shipments has gone to the United States, only minor quantities being absorbed by other markets. Exports to the United Kingdom have declined sharply.

United States of America. In the United States the hardwood species of major importance are relatively few—oak, red gum, poplar, maple, tupelo, and birch, and some other utility species which are exploited to a less degree—but the hardwood industry is the largest in the world. Total fellings of hardwoods for all purposes in 1949 were estimated at almost 89 million m^3(r), which represented nearly 33 percent of total timber fellings.

During the years 1945-49 output of hardwood lumber averaged 17.5 million m^3(s) per year, or about 22 percent of total lumber production. Over the past three decades, the production of hardwood lumber has in general followed that of softwood lumber; the ups and downs have been much less marked, however, and on some occasions the trend has been slightly different. The highest point in postwar production was reached in 1946 when output was 20.3 million m^3(s); the figure dropped considerably in 1947, increased somewhat in 1948 when it was estimated at 18.3 million m^3(s), but, as in the case of softwood lumber production, declined again in 1949 to an estimated 14 million m^3(s).

The increased construction activity during the second half of 1949 resulted in a strong demand for lumber which continued through the first half of 1950. This was reflected in hardwood lumber output, which began to rise slowly. During the first half of 1950, hardwood lumber production was more than 20 percent above the corresponding figure for the first half of 1949. At the same time, total mill stocks decreased to a level almost 11 percent below that of a year earlier. Consumption of hardwood lumber during the first half of 1950 was estimated at almost 19 percent more than in the second half of 1949, and over 46 percent more than in the first half of 1949. Stimulated by demand and strengthened prices, the upward trend in production was continuing into the latter half of 1950.

An important use for hardwoods in the United States is flooring, which naturally follows the development in construction activity. In 1948, oak flooring (including about 4 to 5 percent of other species) reached a high production level of almost 780 000 m^3(s) and maple flooring (including 3 to 5 percent of species other than maple) attained 177,000 m^3(s). Total production of flooring during this year was about 2,100,000 m^3. Production of oak flooring for 1949 was 1,860,000 m^3(s) and that of maple flooring 127,000 m^3(s). During the first half of 1950, production both of oak and maple flooring showed a strong trend. By mid-year, the demand continued strong. There was a somewhat similar development in demand and production for hardwood millwork.

Activity in the furniture, television, and other industries has also greatly increased demand for hardwood plywood, the production of which represents about one-third of the United States total plywood output. In addition, the furniture industry, keeping pace with the construction of new homes, has maintained a high level of demand for hardwood timber.

United States exports and imports of hardwoods, although not as significant in volume and value as softwoods, are of importance to a segment of the trade. Export shipments of hardwood sawlogs and veneer logs in 1949 were 121,000 m^3(r), as compared with 140,000 m^3(r) in 1948. The greater part of the United States exports went to Canada; small quantities were shipped to Latin-American destinations; and exports to Europe increased slightly. United States imports of hardwood sawlogs and veneer logs, which are greater than exports, were only 254,000 m^3(r) compared with 462,000 m^3(r) in 1948. These imports originate mainly in Latin-American and African countries, although considerable quantities are imported also from Canada and the Philippines. During recent years, the Gold Coast has been the most important individual source of supply, shipping 150,000 m^3(r) of logs in 1948 and 60,000 m^3(r) in 1949.

The major part of United States hardwood lumber exports is accounted for by oak. During the past three years, exports of oak have been declining by about two-thirds. The volume of total hardwood lumber exports dropped from 439,000 m^3(s) in 1947 to 187,000 m^3(s) in 1949. The decline in the aggregate value was slightly less. These exports are customarily shipped to a great number of countries all over the world, but the principal buyers have been the United Kingdom and Canada. In 1948 the United States shipped 73,000 m^3(s) to the United Kingdom and 55,000 m^3(s) to Canada; in 1949, however, exports to the United Kingdom declined to 31,000 m^3(s), while those to Canada increased to 101,000 m^3(s). Exports to all countries participating in the European Recovery Program declined from 106,000 m^3(s) in 1948 to 60,000 m^3(s) in 1949, the latter quantity corresponding to only about 10 percent of average prewar an-

*Excludes Newfoundland prior to 1949.

nual shipments to those countries.

During the first half of 1950, the volume of exports of hardwood lumber was about 10 percent below the corresponding figure for 1949.

United States imports of hardwood lumber consist mainly of maple, birch, and beech, and mahogany and Philippine hardwoods. The aggregate volume of hardwood lumber imports was 512,000 m^3(s) in 1948 but dropped to 325,000 m^3(s) in 1949. The principal source of supply has been Canada, which accounted for about 69 percent in 1949. Mexico, the Philippine Republic, certain Central and South American countries and the Gold Coast have also delivered considerable quantities. During the first half of 1950, these imports were almost 84 percent above the corresponding figure for 1949.

Latin America

Mexico is a hardwood producing and importing country, but it also exports some timber. The latest information available indicates that production of hardwood sawlogs and veneer logs, which was about 110,000 m^3(r) in 1947, had dropped to 56,000 m^3(r) in 1948. No data on lumber production is available. During 1947, exports of hardwood lumber amounted to 22,000 m^3(s). Imports of hardwood lumber into Mexico from the United States are reported to have reached 7,000 m^3(s) in 1948 and in 1949.

Cuba. Domestic production of hardwood sawlogs and veneer logs in Cuba for 1949 is reported to have been 73,000 m^3(r), as compared to 163,000 m^3(r) in 1948. At the same time, production of hardwood lumber decreased from 85,000 to 38,000 m^3(s). Imports of United States hardwood lumber alone were 15,000 m^3(s) in 1948, and certain quantities of mahogany and cedar were imported from Mexico, Costa Rica, Honduras, and Colombia. Exports have been declining.

Dominican Republic. This country has been exporting minor quantities of hardwood lumber, mainly mahogany, but because of restrictions imposed on fine hardwoods, the shipments have been dwindling.

Costa Rica is practically self-supporting in supplies of hardwood lumber. Small quantities of mahogany (*Swietenia* spp.) are usually imported from Nicaragua as a result of local border trade. At times, exports of sawlogs and veneer logs from Costa Rica reach considerable quantities. The United States is reported to have imported 44,000 m^3(r) of Costa Rican logs in 1948 and 19,000 m^3(r) in 1949.

Ecuador. With its ample resources of hardwoods, Ecuador is also independent of imported hardwood timber, and could be regarded as a potential exporter. Production of balsa has been increasing during the past years, as new uses for this timber in construction and industry have been developed. Exports, particularly of the heavier type of balsa, have also increased. In 1949, exports of balsa were reported to have reached 1,560 tons, as compared with 1,120 tons in 1948. The United States has been purchasing over 80 percent of these exports.

El Salvador. As a result of extensive deforestation, pursued during half a century, El Salvador has become very poor in hardwoods. Because there is little industrial use, requirements for purposes other than construction are relatively small. However, some quantities of hardwoods, mainly mahogany, are imported, mostly from Honduras under a free-trade agreement existing between the two countries. These imports have been negligible, but they are likely to increase in the near future.

Honduras. The output of hardwood timber is sufficient to cover domestic needs and also to provide minor quantities for export. The United States is reported to have imported 5,000 m^3(r) of sawlogs and veneer logs from Honduras in 1949 (12,000 m^3 in 1948). Exports of lumber from Honduras were 14,000 m^3(s) in 1949 (13,000 m^3 in 1948).

Peru. There has been a considerable increase in consumption of hardwoods in Peru in recent years. This has resulted more from increased output of domestic timber than from greater imports. The principal species imported have been white oak from the United States, and oak and mahogany from Nicaragua. It is reported that a large part of the 1949 production of lumber (totaling 55,000 m^3) was not sold and sawmills carried over big stocks, but the market appears to have recovered since that time.

British Guiana. The output of timber other than greenheart has been increasing during the past three years, reaching in 1949 a volume of about 85,000 m^3(r), a 70-percent increase on the figure for 1946. Total production of hardwood sawlogs in 1949 was 126,000 m^3(r). The bulk of this increase has been absorbed by the local market. Lumber production in 1949 is estimated at 47,000 m^3(s). Exports in 1949 consisted of 8,000 m^3(r) of roundwood; 6,800 m^3(r) of hewn timber; and 15,000 m^3(s) of sawn timber; 61 percent, by value, of the exports went to the United Kingdom, and 24 percent to the British West Indies.

There are comprehensive projects for the expansion of forest exploitation and wood utilization in British Guiana, including construction of a sawmill capable of handling 40,000 to 50,000 tons of logs a year and possible establishment of secondary and subsidiary wood industries.

Surinam. The forest resources have been exploited over a considerable period, and during the first half of the twentieth century exports varied from 600 to 6,000 m^3(r) yearly, shipped mainly to the Netherlands. After World War II, there was a real boom in exports; a maximum of 74,000 m^3(r) of sawlogs was reached in 1947. Then, when a large plywood factory, using babun (*Virola surinamensis*) as raw material, started operations toward the end of 1948 in the neighborhood of Paramaribo, timber exports declined considerably, and in 1949 only 15,000 m^3(r) of logs were exported and 2,000 m^3(s) of sawn wood. The principal markets for Surinam timber exports are the Netherlands, followed by the United Kingdom and the United States. With two modern sawmills, each with an annual capacity of 30,000 m^3, and the plywood factory coming into full operation, production and export capacity are expected to increase considerably in 1950. Local consumption is expected to remain at a level of about 15,000 m^3(s) of lumber.

Chile. With 93 percent of its natural forest area covered with hardwood species, Chile has been an important producer and exporter of hardwood timber.

Output of hardwood lumber dropped from 593,000 m^3(s) in 1947/48 to 443,000 m^3(s) in 1948/49. At the same time, exports of lumber increased from 55,000 to 82,000 m^3(s). Lumber exports from Chile go mainly to other South American countries. Trade is also being built up with the United States.

Brazil. The extensive hardwood forests in Brazil contain some 160 species which are presently marketable. These are suitable or a wide variety o uses in construction and industry. In 1948 production of logs was about 4 million m^3(r), but it declined to 3.8 million m^3(r) in 1949. At the same time, there occurred a slight decrease in hardwood lumber output, from 2,150,000 to 2,100,000 m^3(s). In 1948, exports of hardwood sawlogs and veneer logs reached a volume of about 110,000 m^3(r). During the subsequent years, these exports, which go mainly to other South American countries, dropped to 76,000 m^3(r). Exports of hardwood lumber were 48,000 m^3(s) in 1948. The biggest importers were the Union of South Africa (22,000 m^3) and the United Kingdom (14,000 m^3); minor quantities went to the United States, the Netherlands, and Argentina, as well as to some other European and Latin-American countries. In 1949, the volume of lumber exports was only 31,000 m^3(s).

Argentina, a timber importing country of consequence, is a traditional market for United States and Brazilian hardwood lumber. During the past years, however, currency shortage has had its effect on these purchases. Hardwood lumber exports from the United States to Argentina dropped from 11,000 m^3(s) in 1947 to 2,000 m^3(s) in 1948 and were almost zero in 1949. Imports from other sources have also been very small during the last year. Imports of hardwood sawlogs and veneer logs from Brazil into Argentina showed a drop from 74,000 m^3(r) in 1948 to 46,000 m^3(r) in 1949.

Asia

The war in Korea is having effects on the supply position of hardwoods in the Far East. Prices remain firm and may rise.

Iran. Output of hardwood sawlogs and veneer logs for 1949 was 60,000 m^3(r). Minor quantities of timber are consumed in the manufacture of sleepers and by match, box, and furniture industries; a small proportion is exported.

India and Pakistan. No detailed figures are available on production of hardwood timber in these countires. Imports of hardwood lumber into India were 89,000 m^3(s) in 1948/49, but dropped to 49,000 m^3(s) during the following fiscal year.

Ceylon. Output of hardwood sawlogs and veneer logs increased from 59,000 m^3(r) in 1948 to 90,000 m^3(r) in 1949. At the same time, hardwood lumber production was more than doubled. Minor quantities of sleepers and poles, piling, and posts were produced.

Burma. The political situation has seriously affected supplies and prices. Output of hardwoods, mainly teak, is at a low level. Exports of hardwood lumber still lag far behind the prewar figures; they dropped from 154,000 m^3(s) in 1948/49 to 116,000 m^3(s) during the following year. It is not expected that the 1950 production will be very much larger than that of the previous year.

Thailand. In Thailand, which is another teak producing country, output of sawlogs increased from 780,000 m^3(r) in 1948 to more than 1.3 million m^3(r) in 1949. Lumber exports in 1948 were 91,000 m^3(s as compared with 61,000 m^3(s) in 1947. There has been a ban on export of yang (*Dipterocarpus* spp.) with the idea of forcing domestic prices down since this wood is widely used in construction. The timber used to be one of the biggest earners of foreign exchange. In 1950, Pakistan, being cut off from traditional sources of supply as a result of the Kashmir dispute and the civil war in Burma, made a contract for 4,000 tons of Thai teak.

Thai targets for the years 1950-52 provide for an increase in the production of hardwood logs from 150,000 to 250,000 m^3(r). During the same period, output of hardwood lumber is scheduled to reach 325,000 m^3(s), out of which some 200,000 m^3(s) will be for exports.

Malaya. Timber output in Malaya has shown a steady increase during recent years, despite the disturbed internal situation. This is mainly due to a rise in production of roundwood, which has offset a slight decline in sawn timber production. Output of sawlogs and veneer logs increased from 700,000 m^3(r) in 1948 to 800,000 m^3(r) in 1949. On the other hand, output of sawn timber reportedly dropped from 85,000 m^3(s) in 1948 to 73,000 m^3(s) in 1949.

Exports of Malayan timbers, about 70 percent dipterocarps and 30 percent other types of hardwood, have increased very significantly. From 16,000 tons in 1947, exports went up to 36,000 tons in 1948 and 69,000 tons in 1949. The strengthened demand for Malayan timber on export markets is attributed to quality control. The main importing countries for Malayan timber are the United Kingdom, Arabia, Hong Kong, the Union of South Africa, Australia, India, Indonesia, and Pakistan.

Indochina. The sawmill industry in Indochina, which also is reasonably rich in forest wealth, has been badly disrupted by the unsettled political conditions. The production of sawlogs and veneer logs increased from 213,000 m^3(r) in 1947 to 264,000 m^3(r) in 1948, but it is reported to have dropped to 248,000 m^3(r) in 1949. The present production from the relatively undisturbed areas is little over one-fourth of the prewar level. It is thought that production could reach 1.5 million m^3(r) in the next ten years, affording a good margin for exports.

Indonesia. Unsettled conditions have prevented the planned expansion of hardwood production. This is especially true in South and West Borneo where several private companies have been engaged in obtaining new equipment for logging and for sawmills. Indonesia is an important source of teak and other hardwoods of high commercial value. Output of hardwood lumber, including sleepers, increased from 300,000 m^3(s) in 1948 to 350,000 m^3(s) in 1949.

Philippines. Although much damage was suffered by the timber industry in the Philippines during the war, more than 400 sawmills were in operation in

1949. Hardwood lumber production for 1948 was about 925,000 m^3(s). The Philippine sawmill industry continued to expand during the first months of 1950, and the production of hardwood lumber is planned to increase considerably during the years 1950-52.

For some time after the war, export of logs and sawn lumber was prohibited by the government in order to facilitate reconstruction activity, but bans on exports were removed entirely in June 1949. The only restriction imposed is the grading of export log and lumber shipments by an authorized inspector.

Exports of hardwood lumber in 1948 were 34,000 m^3(s), and exports of sawlogs and veneer logs reached 70,000 m^3(r). According to reports, total exports of logs and lumber were increased by almost 60 percent in 1949. Philippine exports are going mainly to the United States where, as well as in Canada, the species known to the trade as Philippine mahogany are widely used. Japan is regarded as an eventual importer of Philippine timber.

North Borneo. Demand for both export and local use has been strong, causing stepped-up production. In 1949 production of sawlogs was 196,000 m^3(r), as compared with 190,000 m^3(r) in 1948. Exports of hardwood sawlogs and veneer logs increased from 113,000 m^3(r) in 1948 to 119,000 m^3(r) in 1949. Only minor quantities of lumber have been exported. The principal markets were Hong Kong, Australia, Shanghai, and the United Kingdom. Production in 1950 is expected to increase further.

Sarawak. Hardwood timber exports are expanding. In 1949, the volume was 38,500 tons, or almost double that of 1948. Logging and mill operators from Burma have begun working on new concessions, which should produce an increased volume of hardwood lumber in 1950.

Japan. Production of hardwood lumber was 540,000 m^3(s) in 1948 and approximately the same volume in 1949. Considerable quantities of sleepers and pitprops were also produced. Imports of hardwood sawlogs and veneer logs, originating mainly in the Philippines and British Borneo have increased, reaching a total of 50,000 m^3(r) in 1949. Minor quantities of hardwood lumber have been exported.

Oceania

Australia. Of late years the production of hardwood timber in Australia has shown a steady increase. Production of hardwood sawlogs rose from 4,550.000 m^3(r) in 1948 to 4,750,000 m^3(r) in 1949. In 1949 imports of hardwood sawlogs and veneer logs totaled 121,000 m/(r), as compared to 88,000 m^3(r) a year earlier.

Considerable quantities of hardwood, not shown in the above figures, are converted into railway sleepers, pitprops and mining timber, pulp, fiberboards, etc. Production of hardwood lumber has increased from about 2,050,000 m^3(s) in 1948 to 2,140 000 m^3(s) in 1949. Minor quantities, 45,000 and 57,000 m^3 (s) respectively, were exported.

According to estimates, production of hardwood lumber in Australia will exceed 2.3 million m^3(s) in 1950 and 2.6 million m^3(s) in 1951. With the assumption that exports will remain at the present level, imports are estimated to be around 60,000 m^3 (s) in 1950 and 70,000 m^3(s) in 1951.

New Zealand. Production of indigenous hardwoods is relatively small. In 1948/49, production of hardwood lumber was 66,000 m^3(s) and in 1949/50, 68,000 m^3(s). Requirements of durable hardwoods for transmission poles, railway sleepers, harbor works, etc., are to a large extent covered by imports, mainly from Australia. Imports of hardwood lumber have been rising and were 22,000 m^3(s) in 1949.

Another category of hardwoods is specialty hardwoods for furniture manufacture. The most important and most popular species is Japanese oak. Average annual imports of specialty hardwoods during the years 1935-39 were 5,900 m^3(s) ; in the postwar years 1945-48, imports have been negligible. It is estimated that during the years 1950-55 some 9,400 m^3(s) of these woods will be required annually.

The Work of FAO

European Forestry and Forest Products Commission

THE third session of the European Forestry and Forest Products Commission was held at Geneva from 28 August to 1 September. Delegations from the following countries attended the session: Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Netherlands, Portugal, Sweden, Switzerland, Turkey, United Kingdom, and Yugoslavia. The International Labour Office and Commonwealth Agricultural Bureaux were represented by observers. Mr. Marcel Leloup, Director of the Division of Forestry and Forest Products, represented FAO.

The session was highly successful, due in no small part to the work of the Chairman, Mr. Owen J. Sanger, Director of Forestry, England (United Kingdom). Mr. Eino Saari, Professor of Forest Economics, University of Helsinki (Finland), acted as Vice Chairman, and Dr. Howard Grøn of Denmark was appointed Rapporteur.

Forest Policy

Particular satisfaction was expressed at this meeting with the valuable information contained in the progress reports on national forest policies submitted by member countries. In view of the fact that the primary objective of the Commission is the attainment of progress in forest policy through regional co-ordination, the Commission drew up a uniform outline for future reports so that they could be more easily analyzed. There would be no duplication of statistics already transmitted to FAO under the regular statistical program, and the annual Article XI reports required by the FAO Constitution would merely summarize the fuller information presented to the European Commission.

Forest Principles

An important feature of the session was the endorsement of the statement of forestry principles requested of FAO by the Third World Forestry Congress. The basic ideas expressed in the document drawn up by the secretariat were approved in their entirety, but the Commission suggested ways in which the arrangement and expression of these ideas could be improved.

Statistics

The Commission also endorsed the suggestions of a special expert working party on statistics which decided that it was still premature to hold a full European conference on forestry and forest products statistics, since there were many points needing further elucidation. The experts made recommendations with regard to the co-ordination of FAO and ECE statistics, and to the revision and amendment of the current FAO statistical questionnaires. Minimum statistical programs for European countries were also recommended.

Seed and Plant Certification

A major item on the agenda was the question of seed and plant certification, and the discussions raised several problems which needed further study. The Commission expressed concern over the possibility of confusion if species names were changed from time to time for purely systematic reasons. Its opinion that the scientific names of species of economic importance should not be further changed unless the name as a result of erroneous classification had already been referred to the International Botanical Congress at Stockholm. However, the Commission emphasized the need for differentiating, within a broad species, types having different ecological characteristics. The information collected by the secretariat on the organization of the production, control, and distribution of seeds in different countries was discussed. The term "elite stand" should be restricted to stands of which the actual progeny was known to be satisfactory. "Seed stands" should apply to stands classified because of external appearance or because they were known to produce good seed. The Commission considered that it was premature to begin registers of such stands, but countries should start locating their elite and seed stands. The "certificates of quality" and the "certificates of origin" proposed by the IUFRO were approved with minor alterations. It was recommended that countries adopt for internal use certificates of quality and origin closely resembling those adopted for international exchange. FAO was asked to secure the co operation of governments in the exchange of seeds for scientific purposes.

Pests and Diseases

On the subject of insect pests and diseases, the Commission stressed the necessity for immediate warning to FAO of any serious outbreak. Although there was no need to report routine conditions and control methods, it was felt that some form of annual report was required on such points as the history of an outbreak, the success of control methods, and the development of new techniques. Such reports, it was decided, should be submitted regularly with the progress reports on forest policy. The FAO secretariat was asked to collect and circulate information on national legislation relating to insect and fungal diseases in forests. The Commission felt that the general question of control should be left open until the situation was clarified with regard to the proposed International Plant Protection Convention and the establishment of an international center for the reporting of plant pests and diseases, and the exchange of information on national plant quarantine regulations.

Afforestation and Reforestation

The Commission noted with satisfaction the progress reports from member countries on afforestation and reforestation projects, and decided that such reports should be continued with special emphasis on descriptions of plans, statements of the aims and objects of programs, description of means adopted for financing, and information on special difficulties encountered. The attention of the IUFRO and research institutes was drawn to the special importance of studies on the synecology of forest communities, the influence of exotic species on natural forest communities, the action of nonclimax trees on forest soils, the effect on the soil of a cover of such species as were commonly used in artificial regeneration operations, and lastly, the mechanization of reforestation work. For the time being, studies for determining the proportional distribution of forest and cultivated areas in the Mediterranean region should be referred to the Mediterranean Subcommission.

Logging

In the matter of logging techniques and training of forest workers, the Commission wished the FAO secretariat to distribute to member governments information on all aspects of logging, including the results of research and of tests of logging machines and tools. It urged continuance of the work of the secretariat in cataloguing tractors and other equipment, and recommended the creation of a special Technical Committee to serve as a medium for the exchange of experience and information on new developments in logging practices. The importance of accident prevention was emphasized and the Commission recommended that this aspect should receive high priority in training programs for forest workers.

In the light of the reports of UNSCCUR and of the FAO meetings organized this year in Cyprus, at Algiers, and at Amsterdam, the Commission recommended that the study of problems of soil conservation, restoration, and im-

provement be entrusted to an ad hoc body linked with FAO and comprising representatives of all the interests concerned, while the technical aspects of torrent control and soil restoration in mountainous regions should be referred to a special working party.

Finally, the Commission considered the subject of films on forestry. Attention was called to the comprehensive film catalogue of the United Nations Film Board, but it was felt that films needed to be classified into three types, namely, scientific for research purposes, training for the instruction of workers, and propaganda for public enlightenment. Member countries were urged to inform FAO of any new forestry films available, especially those of a scientific nature.

Progress Reports on Forest Policy

As has already been mentioned, a considerable period of the third session of the European Forestry and Forest Products Commission was devoted to an examination and discussion of the progress reports submitted by member nations on their general forest policy.

The reports varied so widely in scope and emphasis that it was difficult to draw clear conclusions as to the present-day trends in forestry in Europe. Since any attempt to co ordinate national forest policies on a regional scale must be founded on such official reports, the delegates at the Commission meeting decided that future reports should conform to a uniform pattern which they then proceeded to outline.

An examination of this year's reports, however, indicates that the main problems now exercising European foresters are as follows.

1. *Annual Fellings and "Possibilité"*

After a period of overcutting due to wartime and reconstruction requirements, all Western European countries appear to be trying to reduce annual fellings to a volume close to that of the net average annual growth. These efforts have not so far been altogether successful. In France during the past years insect attacks and forest fires have made it necessary to cut a considerably larger volume of timber than normal. Elsewhere too the cut in 1949 appears to have been much higher than was warranted. The United Kingdom, after having set a limit of 1,075,000 m^3 for 1949, reduced this figure by 140,000 m^3 for 1950. The volume of 250,000 m^3 authorized in the Netherlands was exceeded. In Switzerland, the drain exceeded normal growth by 22 percent.

At the same time, however, it is interesting to note that a country like Finland, which has always been a major timber producer, has reduced its cut considerably. True, this decrease applies only to fuelwood, pitprops, and pulpwood, but for the 1948/49 season it amounted to 16 percent as compared with the year before, the total volume cut being 29 million m^3. For the season 1949/50, a further decrease of 4 million m^3 below the previous year's total was anticipated. In Austria, on the contrary, the volume of fellings rose in 1949 to 9,230,000 m^3 compared with 8,690,000 m^3 in 1948.

2. *Afforestation and Reforestation*

From Ireland to the countries of the Near East, the afforestation of waste land and the reforestation of degraded or overmature forests are matters of major concern. Almost all countries have adopted relatively large scale and long-term reforestation plans. Austria has incorporated its proposed reforestation plan for 300,000 hectares into the general plan for the economic development of its forests and forest industries formulated in 1949, and expects assistance from FAO in this work. The Commission was interested to learn of Turkey's achievement in successfully enforcing a law dating from 1937 which obliges municipalities to establish their own forests. Fourteen large State forest nurseries have been created for this purpose, serving the eight reforestation regions into which the country has been divided.

Portugal has decided to expand its 1938 reforestation program, originally intended to apply to the northern portion of the country only, to cover the southern portion and the Azores and Madeira Islands. Israel has already planted 980 hectares, improved 440 hectares of natural forests, enlarged existing tree nurseries, and created new ones with a view to growing eight million plants in 1950/51, as part of the reforestation program submitted to the government at the beginning of this year. Even in Belgium, where intensive competition for land use scarcely permits the establishment of new forests, an additional 500 hectares were planted to trees in 1949.

Successes are also reported in the implementation of existing reforestation plans. During the first four years of its reforestation plan, Great Britain planted 101,200 hectares to forest. In France, 45,000 hectares have been planted by 1949. The results achieved in Yugoslavia are particularly remarkable, for that country completed its five-year plan in three years and was in addition able to undertake a supplementary program.

Difficulties frequently arise in reforestation projects. The most serious seem to occur in Ireland and, to a lesser extent, in Great Britain, where the attempted purchase or acquisition of land by the State for reforestation purposes runs up against existing land tenure systems, the extreme subdivision of property holdings, and above all the difficulty of determining, as regards marginal lands, what is the most advisable type of land use, whether as grazing or as forests, under present and future economic conditions.

Any considerable extension of reforestation operations may raise serious problems, and concern was voiced on this point within the Commission, particularly by the Yugoslav delegate. What will happen to these artificial plantations in the future? What will be their effect on the soil? Are the species selected and the seeds used adapted to the localities chosen? Despite progress in research and efforts to avoid committing the errors of the past century when vast pure artificial stands were established in Central Europe, the problems are still largely unanswered.

3. *Pests and Diseases*

The opportunity created by new plantations for dangerous outbreaks of insect pests and plant diseases is another serious problem which must be considered.

Reports submitted to the European Commission indicate that the large-scale invasions of *Bostrychidae*, which ravaged softwood stands of Central Europe during recent years, are now over. However, there is disturbing news that some diseases and certain insects may be spreading to areas which were previously either entirely free or only slightly affected. For instance, the Dutch elm disease has been observed for the first time in Sweden, and a fresh attack of *Panolis flammea* and *Lymanbria monacha*, although less serious than that in 1948, has affected 8,600 hectares of pine. In Denmark, a large-scale outbreak of a disease associated with a bostrychid, *Hylesinus micans*, which has hitherto been extremely rare, occurred recently. This bostrychid has also been found in the Netherlands, attacking plantations of Sitka spruce, together with *Ips typographus*. In Belgium, a Lophyrus (*Lophyrus rufus*) which had previously been rare, caused some serious although not fatal damage. Finally, the menace of *Endothia parasitica* still hangs over Southern Europe, having extended its range to Italy; the Italian Delegation announced that the blight is also attacking oak trees.

Despite the present comparative inactivity of insect pests, and despite advances in methods of combating them, notably by spraying insecticides, the danger of the spread of disease and of insect attack continue to be of serious concern to European silviculturists.

4. *Modernizing Forest Operations, Extraction of Forest Products, and their Utilization*

All countries are interested in modernizing their forest industries, particularly forest extraction operations. In addition to increasing output and improving the quality of the work, the rationalization of logging operations helps raise the standard of living of the forest workers. A survey conducted in Denmark has demonstrated the need for such action by bringing to light the dislike evidenced by young men for employment in logging and other types of forestry work.

The results which can be expected from rationalization have been demonstrated in Finland, where the industry was modernized long ago. A very marked increase in output has been noticeable, and this country is continuing its efforts to improve conditions. A group of industrial concerns recently opened a new school for professional training, while special courses in felling, hauling, and transport methods have been organized by forest owners. The mechanization of logging and transport operations is in progress, and the use of trucks and tractors for haulage is increasing.

A similar trend is to be observed everywhere. Norway is intensifying the mechanization of planting operations, nursery work, and timber extraction. Switzerland, through a Fund established in 1950 with the participation of forest owners and the timber trade, is expanding professional instruction in forestry and expects to set up a professional for-

estry school in 1950. Sweden has applied on a small scale a comprehensive plan for professional training in this field. Technical training is also being widely developed in Western Germany and there is a definite trend toward the mechanization of all phases of forest work. Significant developments along the same lines are also reported by Denmark.

Many countries are much concerned with the problem of utilization of waste and by-products and small size timber. Switzerland particularly is seeking new outlets for its fuelwood production and is now concentrating attention on the conversion of wood into sugars, yeasts, and alcohol. Serious obstacles to such developments are the high initial cost of such products and the limited market outlets. In France, where this same problem is acute, a Joint Commission on Industry, Commerce and Agriculture was established in 1949 to study the profitable utilization of usable waste products and fuelwood.

5. *Forest Law*

Some countries, for instance the Netherlands and Austria, have undertaken a complete revision of their forest laws to encompass all existing legislation and bring it into accord with present-day conditions. Israel awaits official ratification of its first Forest Ordinance. Most innovations in forest law, however, merely reflect the problems already mentioned in preceding paragraphs. Many countries are attempting to encourage reforestation measures by special provisions for the benefit of landowners and communal or collective property-holders. In the United Kingdom this was done through the Dedication Scheme which has so far been only partially successful. It is hoped that it will become increasingly effective following the abolition of maximum timber prices and the introduction of certain new modifications in the working of the scheme. In Belgium a decree was issued in 1949 subsidizing communal logging operations to the extent of 30 percent, and the Netherlands have extended the benefits of the so called Law on Sites to most of its property owners. Finland has prepared a draft forest code with respect to private forest owners and a draft law on forest owners' associations.

In another direction the report of Finland also mentioned a regulation controlling the hours of work in forest employment, covering logging, extraction, and floating operations. In Western Germany the basic salary scale for forest workers has been revised, based on scientific observations on man day output.

The Belgian authorities have issued a decree re-emphasizing forest and tree protection. In Austria and the Netherlands all taxes on timber have been eliminated. In Denmark taxes on fuelwood have also been removed, but not on timber.

6. *Research*

The basic problems with which forest policy is confronted are reflected in research. The major trends may be summarized as follows.

With regard to reforestation, all the varied aspects of genetics research are receiving close study. In Belgium, a census of elite stands is now being conducted. In the United Kingdom and Portugal, active genetics research is being carried out. In Sweden, the supply of genetically sound seed is being thoroughly investigated.

In Austria, where two new research institutes have recently been established and where all work is now co ordinated by the Austrian Society for Wood Research, an ecological forest map has been prepared. With respect to land utilization in general, France undertook a survey of erosion losses which shows that wind erosion has ruined 500,000 hectares and water erosion 2,700,000 hectares. A study of comparative yields of marginal lands planted to forests and to crops is being conducted in the Netherlands.

Italy is continuing research on tree diseases and particularly *Endothia parasitica*. Several countries are experimenting with new spraying techniques and equipment.

A striking development is the intensification of research for improved labor efficiency in forest operations, particularly through the use of mechanical devices in all phases of work. We hear of research on the use of tree planting machines, mechanical saws, and haulage tractors.

This summary naturally gives only a very limited idea of the important and varied research being conducted in European countries. Many other developments deserve mention, such as research on chemical debarking in Finland, and on the systematic use of aerial photography in Sweden. However, the subjects mentioned are those which are receiving the most widespread attention, according to the reports submitted to the European Forestry and Forest Products Commission.

ECE Timber Committee

IN June the Economic Commission for Europe held its fifth session at Geneva and included in its work a discussion on the activities of the Timber Committee. After hearing a report presented by the chairman of the committee, Mr. A. Ceschi (Austria), the Commission approved new terms of reference for the Timber Committee, which was described as one of the more successful United Nations bodies functioning in Europe.

The early meetings of the ECE Timber Committee, the secretariat for which is provided by FAO, were dominated by various aspects of the problem of shortages. A procedure was adopted whereby the importing countries observed agreed buying limits for sawn softwoods and the exporting countries made available agreed quantities of timber. This helped to bring about a fair distribution of supplies at prices which were lower than would otherwise have been the case, and had a stabilizing effect on the market.

At the same time the Committee recommended policies designed to increase European timber production. A program of timber loans was developed through which exporting countries would increase their capacity on the basis of two to three year purchase commitments from importing countries. The payment provisions of these contracts covered the service on loans used to pay for necessary imports of timber producing equipment. While the full scheme contemplated by the Timber Committee did not materialize, the International Bank did make equipment loans to two countries, based on timber purchase commitments from five countries. The co operative idea behind this approach still has great interest and value.

The timber shortage was approached in another way in collaboration with ECE's Housing Subcommittee through a study on rationalization in the use of wood. Two useful interim reports have been produced and the investigation is being continued under Mr. J. Campredon (France) with the help of experts designated by governments. A working party established at the sixth meeting of the Timber Committee met at Geneva 3-6 July with Mr. J. L. Bienfait (Netherlands) as chairman. This group reviewed further possibilities for technological improvements in forest operations, sawmilling, woodworking industries, waste utilization, construction, and packaging. It considered technical training, research, and a European timber documentation center, and it discussed trends in the use of wood, observing that the present high costs of timber were not in the interest of its rational use and long-term prosperity. Various recommendations were put forward for consideration at the Timber Committee's next meeting.

All these activities of the Timber Committee have required the collection of statistical data and the preparation by the secretariat of market analyses, which appear in the joint ECE/FAO *Quarterly Bulletin of Timber Statistics* published at Geneva.

In 1949, the period of acute postwar timber shortage ended and gave way to a phase of rather precarious equilibrium between supply and demand. The Timber Committee found that the combined European import demand for sawn softwoods was below its earlier estimates and concluded that the device of "buying limits" was no longer necessary. The situation was due to several factors, including the disastrous forest fires in France in the summer of 1949, and temporary governmental controls on the import of timber and its consumption in housing and other uses.

It is true that technical improvements in the utilization of wood and in design and the employment of substitutes may keep the level of demand below prewar. The present price levels for timber also tend to discourage demand and a lowering of prices is unlikely in the near future. But demand is certain to rise.

Housing requirements, stifled for years, must be met one day. Since foreign exchange considerations seem likely to continue to hamper free access to overseas markets, Europe's timber needs must largely be met from European sources. Failing large scale supplies from the U.S.S.R. or other areas, European production alone cannot be expected to match prospective demand, if and when restrictions on consumption are relaxed.

At its sixth meeting in April, the Timber Committee decided that in 1951 a balance between demand and supply, including imports from the dollar area, might be difficult to secure, and that there might be a recurrence of the shortage problems of the immediate postwar years.

In view of this, the ECE considered that the Timber Committee was a necessary meeting place for the international consideration of problems affecting the availability of a commodity which must always constitute an important factor in the European economy. Certainly there is clear need for collaboration between producers and consumers in the joint consideration of market forces. Accordingly, the ECE agreed that the Timber Committee should keep the market position under close review and make necessary recommendations to governments, and that the secretariat should therefore continue the collection of statistics and the publication of periodic market reports.

Meanwhile the Timber Committee has instructed the secretariat to study the possibility of formulating price indices for timber in each country, as a guide to changes in demand and supply, to be correlated with general price movements. The secretariat is also undertaking a study of probable future consumption trends in European countries.

The seventh meeting of the ECE Timber Committee took place at Geneva 30 October-2 November. The session examined the sawn softwood import needs of European countries for 1951 and the possible export availabilities, and foresaw a deficit in meeting 1951 requirements. In 1950 import needs appeared to be approximately in balance with availabilities and raised no serious supply difficulties. For 1951, however, supplies might be some 13 percent below import requirements of about 3¼ million standards, even taking into account increased imports from dollar areas. It was felt that, despite high prices, European export supplies could not be raised further to keep pace with increasing import demand. The absence of delegates from East European exporting countries made it difficult to carry out a detailed assessment of the situation.

The Committee forecast a deficit of 650,000 m^3 in pitprop supplies for 1951, but at this stage the figure did not appear unduly high. The advisability of early buying was evident in view of the strong competing demand for pulpwood.

The secretariat was instructed to secure information regarding the teaching staffs and curricula of technical woodworking schools in Europe and to submit a report to the next meeting of the Committee. Delegates also discussed the desirability of recording the movement of timber prices in each country against the background of general price movements. The secretariat will consult with governments on the statistics available in their countries on relevant prices and price indices.

Proposals for improving timber statistics were considered, and recommendations of a working party of experts on the more rational utilization of wood were approved with minor changes. It was agreed that in principle improvements in the rational use of wood should be sought through persuasion and education.

The International Classification of Forest Bibliography

AT its final meeting at the Hague in June 1950, the Joint FAO/IUFRO Committee on Forest Bibliography approved the final draft of the new classification system and named it the *Oxford System of Decimal Classification for Forestry*. It has now been submitted to the International Union of Forest Research Organizations and to FAO for adoption.

The International Association of Forest Research Institutes first placed the question of forest bibliographies on its program in 1903. In 1929 the name of the organization was altered to International Union of Forest Research Organizations (IUFRO), but this in no way affected the work which had been undertaken with the object of creating a universal system of bibliographical classification. This work was commenced by the Bibliographical Committee, which has functioned since 1903 as a permanent working organ of the earlier Association and of the IUFRO.

The most important name in the history of forest bibliography is that of Dr. Philip Flury. This Swiss forester was a member of the Bibliographical Committee from its beginnings and it was he who did the greater part of the creative work.

After long and difficult preparations the Bibliographical Committee presented to IUFRO in 1933 a complete system for the classification of forest literature which, in its printed form, bore the title *Forest Bibliography*. This new system was assigned the index number 634.9 F in the International Decimal Classification which was based on the system of Melvil Dewey.

The IUFRO decided to name the new classification the *Flury System*. Since 1933 it has been used to classify the International Bibliography of Forestry organized by the IUFRO and published annually with separate treatment for each country participating in the work. In its final form this system was integrated into the Universal Decimal Classification as 634.9.

Former chairmen of the Bibliographical Committee, who guided its proceedings up to the time when the Flury system of classification was completed, were Prof. A. Bühler (Tübingen), Prof. A. Oppermann (Copenhagen), and Prof. R. S. Troup (Oxford).

As has been seen, the preparation of the *Flury System* of classification covered a long period of time, during which there were great developments in forest research work, particularly in the fields of wood technology and forest economics. New developments continued at an increasing rate after the system had been published and, even in the 1930's, the need for revision of the classification system was under discussion by the Bibliographical Committee of IUFRO. These discussions were interrupted by the Second World War.

The first postwar meeting of the Bibliographical Committee was held in Zurich in 1948 under the chairmanship of Prof. H. Burger. At this meeting, Mr. F. C. Ford Robertson, Director of the Commonwealth Forestry Bureau at Oxford, presented a completely revised system of classification for forest literature, which had been prepared by his Bureau in collaboration with the Forestry Commission of Great Britain, and the Forest Products Research Laboratory at Princes Risborough. Revisions were based upon ten years of experience gained by the Bureau in the course of its bibliographical services. The major part of the new and creative work was credited to Mr. P. G. Beak, Deputy Director of the Bureau.

No immediate action was instituted by the Bibliographical Committee because the IUFRO was at that time engaged in negotiations regarding a working agreement with FAO. As soon as possible, however, the International Council of IUFRO proposed to FAO the appointment of a joint bibliographical committee to study the new classification and to make appropriate recommendations to its parent bodies. On this joint committee IUFRO was to be represented by Messrs. A. Oudin, Director of the Ecole Nationale des Eaux et Forêts at Nancy, F. C. Ford Robertson, Director of the Commonwealth Forestry Bureau at Oxford, and Eino Saari, Professor at the University of Helsinki. FAO welcomed the initiative taken by IUFRO and appointed Messrs. J. D. B. Harrison and Rene G. Fontaine as its representatives.

The Joint FAO/IUFRO Committee on Forest Bibliography held its first meeting at Helsinki in 1949, during which Mr. Harrison acted as Chairman. Subsequently, Professor Saari was elected permanent Chairman because it was not possible for Mr. Harrison to attend. Mr. Fontaine acted as Secretary for all meetings.

The proposed new classification system submitted by the Commonwealth Forestry Bureau was carefully examined in all its details and, at different stages of revision, was circulated to members of IUFRO and other research organizations in order that the Committee might benefit by replies from as many experts as possible. All criticisms and proposals for amendments were carefully considered and a large number of them were adopted. In the course of the revisions the sections dealing with forest economics (classes 6, 7, and 9) were completely re-

organized in accordance with proposals submitted by Professor Saari.

The Committee also discussed with representatives of the International Federation of Documentation (FID) the possibility of integrating the proposed new system into the Universal Decimal Classification. It became evident that certain additional modifications were necessary in order to bring the new forestry classification into harmony with the general arrangements of the UDC, and these were successfully accomplished with the aid of Ir. F. Donker Duyvis (the Hague) and Dr. W. W. Varossieau (Delft).

During the whole course of the several revisions the skill and experience of Mr. Beak and the assistance he willingly gave the Committee, both during meetings and in the intervals between them, have been a most important factor in the success achieved.

OXFORD SYSTEM OF DECIMAL CLASSIFICATION FOR FORESTRY
SUBJECT CLASSIFICATION
CONSPECTUS OF PRIMARY HEADS

0 Forests, forestry, and the utilization of forest products. (General)
(General *regional* accounts of forests and forestry are included under the primary subhead 904.)
1 Factors of the environment. Biology.
2 Silviculture.
3 Harvesting of wood, logging and transport. Rationalization of work; work studies. Forest engineering.
4 Forest injuries and protection.
5 Forest mensuration. Increment; development and structure of stands. Surveying and mapping.
6 Forest management. Business economics of forestry. Administration and organization of forest enterprises.
7 Marketing of forest products. Economics of forest transport and the wood industries.
8 Forest products and their utilization.
9 Forests and forestry from the national point of view. Social economics of forestry.

Auxiliary numbers of subject —01 to —09 are used to classify general notions (e.g., research, harvesting, protection, national and international aspects, etc.) which do not have significance until related to particular heads of the scheme.

Auxiliary numbers of form (0) refer merely to the form in which information on a given subject is presented (e.g., an encyclopedia, textbook, report, etc.).

Auxiliary numbers of place (1 to 9) are borrowed directly from the UDC and are mostly identical with the geographical numbers of the *Flury System*.

Forestry and Forest Products Commission for Asia and the Pacific

BANGKOK, Thailand, was the location for the first session, 9-17 October 1950, of FAO's Forestry and Forest Products Commission for Asia and the Pacific, the establishment of which had been approved by the Fifth Session of the FAO Conference. The meeting was particularly well attended, with delegates present from Australia, Burma, Ceylon, China, French Union, India, Indonesia, Philippines, Portugal, Thailand, United Kingdom, and the United States, and observers from the Supreme Command Allied Powers (Japan), the Holy See, UN Economic Commission for Asia and the Far East, International Union of Forest Research Organizations, the Pacific Science Congress, and the International Meteorological Organization. Mr. W. H. Cummings, Regional Representative of the Director-General, and Mr. Egon Glesinger, Deputy Director of the Forestry and Forest Products Division, attended from the FAO secretariat.

The inaugural session of the Commission, the third such regional body to be established by the member nations of FAO, was addressed in the Royal Palace by His Excellency Field Marshal P. Pibulsonggram, Prime Minister of Thailand, after being formally opened by His Excellency Phra Chuang Kaset, Minister of Agriculture, Thailand, who was elected Honorary Chairman.

Executive Committee

At the first business meeting, Mom Chao Suebsukswasti Sukswasti, Dean, College of Forestry, Kasetsat University, Thailand, and Director-General of the Thai Forest Industries Organization, was elected Chairman. Dr. C. H. Holmes, Senior Assistant Conservator of Forests, Ceylon, and Shri M. D. Chaturvedi, Inspector General of Forests, India, were elected as Vice-Chairmen, and Mr. J. P. Edwards, Acting Director of Forestry, Federation of Malaya, appointed Rapporteur. In adopting rules of procedure, the Commission decided to establish an Executive Committee, comprising the Chairman and two Vice-Chairmen, with the Chief of FAO's Far Eastern Forestry Working Group as Secretary, to act for the Commission between sessions which, on a motion of the delegate of India, it was decided should be held biennially, in alternate years to the FAO Conference.

Korea

The representative of the Director-General advised the Commission that the Economic and Social Council had called on the specialized agencies to give their utmost support to providing such assistance for the relief and support of the civilian population of Korea as might be requested by the Unified Command through the Secretary-General of the United Nations. The observer for SCAP (Japan) stressed the urgent need for sawn timber, fuelwood, and charcoal for the rehabilitation of Korea. The Commission, noting that some countries of the region had stocks of sawn timber available for immediate delivery if shipping could be arranged, expressed a desire to assist in any way possible and instructed the Executive Committee to keep the situation under review.

Forestry Principles

One of the items before the Commission was the statement of forestry principles prepared by FAO following a recommendation of the Third World Forestry Congress. This statement, which is also being submitted to the European and Latin-American Commissions, was accepted as a presentation of minimum requirements on a world-wide basis, but the Commission went further and adopted a separate statement defining these principles in greater detail with regard to the Asia and Pacific region. This separate statement called on each government to declare its forest policy, and urged governments to consider the problem of land utilization as a whole, not piecemeal, since forestry must constitute an integral part of balanced and complementary land use.

Dalat Meeting

Consideration was next given by the Commission to the report of the technical meeting on Standardization held at Dalat, Viet Nam, in April 1950 (see UNASYLVA, Vol. IV, No. 3, p. 136). While agreeing that the recommendations of the Geneva conferences on Wood Technology should be decisive with regard to timber testing methods, the Commission accepted the Dalat report as providing guiding principles in the evolution of common standards for the region, as far as these are practicable, and decided to establish a permanent working party under the chairmanship of Mr. M. Boucaud, delegate of the French Union, which could continue to work on questions of timber nomenclature, grading, dimensions, and testing methods, largely by correspondence, until the next session. The Commission recommended that countries having an export trade in timber should study the following rules, and consider adapting their own established grading practices to conform to them as far as practicable:

Teak
  Burma (Seman-Limaye) Grading Rules
Hardwood logs
  North Borneo Grading Rules
Sawn hardwoods
  Malaya Grading Rules.

Mysore Recommendations

The Commission devoted its early meetings to hearing reports from delegates on the action taken by governments upon the recommendations of the Mysore Forestry Conference of 1949, which are considered as a charter for forestry activities in the region. There was evidence of considerable progress in most countries, despite many difficulties, and the Commission recommended that governments continue to use every effort to make further progress in implementing the Mysore resolutions, reporting to FAO annually on what had been achieved under a standard list of headings which the Commission adopted. The secretariat was instructed to circulate such reports to member countries in advance of the next session of the Commission, which the delegate of the United King

dom, on behalf of his Government, invited to meet in Singapore and the Federation of Malaya.

Program of Work

During the discussions on FAO's expanded program of technical assistance, of which member governments were urged to take full advantage, delegates emphasized the need for co-ordination with the bilateral programs of the United States and with the Commonwealth Technical Cooperation Scheme, and a resolution to this affect was adopted.

Before completing its session, the Commission also outlined a program of work for the secretariat. This included the analysis of annual progress reports from member countries dealing with the place of forestry in the national economy; taking up with the appropriate authorities the question of reducing shipping rates for the transport of forest products; setting up machinery for the exchange of forest seeds between member countries; securing co-ordination of research on the pulping of tropical woods; providing information on the procurement of logging and sawmill machinery and other technical equipment in response to specific requests; studying the possibility of co-ordinating forest research and using existing research and educational facilities on a regional basis; and, finally, investigating the problems of shifting cultivation in the different countries of the region and disseminating information regarding its control. In connection with this last point, the Commission requested the Director-General to consider the possibility of calling a regional conference on Soil Conservation, with the preparation and organization of which forestry authorities should be associated, to take the place of the Land Utilization Conference which was to have been held in Ceylon in August 1950.

The Commission closed its session by expressing gratitude to the Government of Thailand for its generous hospitality and for the many pleasant excursions which were made around Bangkok. Not the least of the advantages of the meeting, the delegates felt, was the opportunity to make or renew professional acquaintances, to exchange ideas and experiences, and to pool scientific knowledge.

* * *

The following notes on items of the agenda were submitted by the delegate of Australia and are reproduced here because they undoubtedly contain much of interest to all member countries of FAO.

Integrated Utilization of Tropical Woods

Developments in forest products activities in the region might best be made in conjunction with programs for establishment of further wood-using industries through integrated utilization. However, for any plan to be successful, adequate consideration must be given to factors such as forest resources of raw materials, potential markets, transport facilities, labor, water supply, and economic feasibility.

Already certain information is available concerning many species and forests in the region, but there is need for much greater knowledge of the specific constitution of tropical forests in many areas. The main requirements are:

1. General information on the gross volume available in all species irrespective of their current use.
2. A detailed knowledge concerning the individual species as regards:
   (a) true species identification of all trees in the forest (this will require co-operation between the forester and the forest botanist);
   (b) full information concerning each species and its availability in quantity and quality;
   (c) a determination of the properties of each wood.

Australian work in co-operation with foresters in New Guinea and North Borneo has shown the very great value of this line of approach. Unfortunately, it is difficult to correlate such knowledge with trading practices, where far too much reliance is placed on local or trade names. Considerable confusion results from uncertainty of identification in the forest and from the use of the same name for different species in different areas and, conversely, the use of different names for the same species.[1]

Obtaining all the information mentioned above will be a long term project and will require considerable organization and time for completion, but there should be no delay in initiating this work. If development were postponed till this project were completed valuable time would be lost. From the short-term point of view it would therefore be of advantage to each country to have a summary of existing knowledge relating to the constitution of the best or most accessible forest areas. Such information would provide a valuable guide to determining to what extent additional wood using industries might be set up.

Up till now the major utilization of forest products from this region has been for fuel, constructional timber (both squared and round) and veneers, only a limited number of species having been accepted for sawn timber and veneer for home or export markets. The value of logs and flitches for veneer manufacture is generally much in excess of their value for other uses, but high quality material is required and consequently logging, even in conjunction with sawmilling operations, is costly. Further veneer supplies may be obtained by immunizing sapwood veneer against the *Lyctus* borer.

The extent to which benefits, both in closer utilization of forest resources and economy in harvesting, might result from accepting additional species for sawn timber and veneer manufacture and establishing, in conjunction with sawmilling operations, fiber building board manufacture or paper pulp manufacture, is well worthy of investigation. The fact that fiber building boards may be produced from practically any species means that instead of selective logging being practiced as now, it should be possible in suitable areas to log on a face. Logs for veneer, sawn timber, fiberboard, or paper pulp could then be allocated according to species and quality. As timber waste is readily converted into fiber building boards, an expansion of species acceptable for sawing might arise from diverting unwanted sapwood from sawmills to fiberboard plants with benefit in production costs to both industries. Other species unsuited to sawmilling might be directed to fiberboard or pulp mills.

The possibilities of tropical species for paper pulp should not be overlooked. Some recent French work reported to FAO's Committee on Wood Chemistry describes how 24 different species taken from the Ivory Coast of Africa, in proportions corresponding to the natural composition of the forest, were successfully pulped and made into 150 tons of all kinds of excellent quality papers. If it could be shown that similar results might be achieved with mixed species from forests of this region, the integration of pulping with sawmilling, plywood, and fiberboard manufacture might well become an economic proposition if the location for the plant be soundly chosen.

Meeting Future Requirements for Specialty Timber

Utilization of the wide range of species commonly occurring in tropical areas gives rise to many problems, the chief of which are as follow:

(1) Limited availability of many species.
(2) High extraction costs.
(3) Wide variation in properties.
(4) Marketing problems.

In the northern temperate zones where the number of species currently used for commercial purposes is restricted to several genera of coniferous woods and perhaps twenty genera of broadleaved species, harvesting and utilization problems are simple and, in consequence of the large available volume of each of the groups, it is possible by selection to obtain material suited not only for general purposes but for speciality purposes. In tropical areas, although it may be possible to choose woods which have properties comparable with those of timbers now in wide commercial use, the problem of obtaining adequate supplies of requisite quality is very difficult. It is believed, therefore, that countries within the region should consider seriously advantages which might be derived from establishment of plantations of native and exotic timbers specially selected with a view to reducing utilization problems. To do this, close co operation between foresters, botanists, ecologists, and forest products workers is essential to ensure that adequate consideration be given to selection of site and species so that plantations would have a reasonable prospect of success. Silvicultural treatment should be such as to ensure that the same properties are obtained in timber derived from plantations as occur under natural conditions. Approximately 75 percent of the world consumption of sawn timber is in coniferous woods compared with 60 percent in this region where the estimated resources of coniferous woods comprise only 25 percent of the total forest area. Plantations might, therefore, be considered under two heads:

(1) Conifers for general utility.
(2) Broadleaved woods for speciality uses.

[1] A secretariat document on *Proposed Standardized Timber Trade Names for Asia and the Pacific* was referred to the permanent Working Party mentioned earlier.

To cite an example of the first, in Australia the extreme shortage of softwood has necessitated using comparatively hard, heavy woods for general purposes. However, as a result of a progressive policy of establishing plantations of conifers, approximately ¼ million acres of pine plantations have been established and are now yielding at a rate approaching 100 million super feet[2] per annum and it is anticipated that in ten years time the yield might well be quadrupled.

In reference to the second, plantation of selected broadleaved trees has commenced in various parts of the region, e.g., teak, balsa, Honduras mahogany. This development might be encouraged so that broadleaved species with definite properties will be readily available in the future.

The above are only examples, but the authorities concerned in the various countries will be able to add species desired to this list. It may well be that some countries will require specialist assistance in pursuing this project.

Measures to Prevent Loss Due to Insect and Fungal Attack

A problem common to the timber industry in practically all countries of the world is attack by that group of insects known as the powder post borers (*Lyctidae* and *Bostrychidae*). These borers cause extensive damage in the starch-containing sapwood of many hardwood timbers, and their attack, apart from causing direct monetary loss, has prevented the effective utilization of many susceptible but otherwise excellent timbers. In timber species such as the eucalypts, which have a relatively narrow sapwood (seldom exceeding 1½ inches), the damage is usually not sufficiently serious to warrant special treatment, but a large number of non-eucalypt tropical rain forest species occurring throughout the region have a wide band of sapwood, often up to 6 inches in depth and sometimes even wider, for which preservative treatment is essential if these timbers are to be used for any but minor purposes.

In Australia the common powder post borer is *Lyctus brunneus* Stephens, which has become a widespread pest of many of our subtropical timbers. Research work over the past 18 years has led to the adoption as standard practice of a number of treatments which give complete and permanent immunity to *Lyctus* susceptible timber. These treatments involve immersing the green veneer or timber in a solution of boric acid or borax. For green veneer a momentary dip in the cold solution is all that is required, followed by a short block stacking period to permit diffusion of the chemical. For solid timber, which may be either green or partly dry, a modified hot and cold bath treatment has proved highly successful. This involves heating the timber in the solution to a temperature of approximately 200° F. for a period of two to four hours, depending on the thickness and species of timber, and then allowing the charge to cool to about 160° F. in the solution.

Control of this treatment can be made most conveniently by altering the magnitude of the temperature drop. The required commercial minimum for immunization is 0.2 percent (calculated on the oven dry weight of the wood), and by this treatment, or modifications of it, boards up to 2 inches in thickness may be satisfactorily treated.

In addition to this hot and cold bath process, low pressure impregnation of *Lyctus* susceptible species with suitable water soluble salts is, of course, equally effective in preventing attack. Since boric acid is not effective against decay at the loadings used for *Lyctus* immunization, the use of other toxic water soluble preservatives may prove more effective, especially if the timber is likely to be exposed to decay and termite attack. The possibility of using superficial applications of light oil solvent preservatives such as pentachlorphenol, DDT, and copper naphthenate, etc., may also be worthy of attention where only relatively short term protection is required. The disadvantage of superficial treatment, however, is that subsequent sawing may expose untreated timber to *Lyctus* attack. Complete penetration to the core by the hot and cold bath treatment completely avoids this possibility, and for timbers with wide susceptible sapwood, only full penetration with a permanent preservative is advisable.

The cost of treatment by the boric acid process has been estimated at approximately 8 shillings (88 cents) per 100 super feet of timber, although cost will, of course, vary with the size of the treating plant, the volume of timber treated, and labor costs.

Pinhole Borers. The incidence of pinhole borer attack is of considerable importance to the exporter of attacked timber, since it almost inevitably results in a lower return and quite often involves the expense of fumigation or other treatment demanded by quarantine officers at the port of entry. Since pinhole borer attack occurs in the forest in dead and dying trees and may often continue in green logs or even in green sawn timber which is not quickly dried, control is mainly the concern of the logger and sawmiller. In Australia much reliance has been placed on creosote oil for the spraying of freshly felled trees; more recently, the use of benzene hexachloride has been shown to be more effective for this purpose, and it can be generally stated that logs sprayed on all surfaces as soon as possible after felling with a light fuel oil containing 3½ percent of benzene hexachloride (12 percent gamma isomer content) will be protected from pinhole borer attack for a period of up to three months. Probably equally effective is the rapid removal of logs from the forest in order to hasten surface drying, and the conversion of the log to sawn timber as soon as possible.

Sap Stain. Discoloration due to sap stain fungi may be responsible for considerable economic losses in many exportable timbers, although the infected wood is usually not seriously weakened (except perhaps in impact resistance). In practice the development of sap stain in timber can be controlled in two ways: (a) by rapidly drying the timber to a moisture content too low for development of the stain fungi, or (b) by treating the freshly cut timber with a preservative. (A third method, the total submersion of the timber in water is also sometimes used.)

The methods of handling and seasoning timber are most important factors in the prevention of sap stain, and where logs can be removed quickly from the forest and then rapidly converted to boards and seasoned, sap stain is not a serious problem. However, in the tropics where the rate of drying of freshly sawn timber or of green logs is often slow enough to permit the development of staining fungi, even where the timber has been quickly converted and properly stacked, the use of chemical dips is of great value.

The best procedure is to dip the timber green off the saw in the anti-stain chemical and then to stack in the usual way. The commonly used chemicals include sodium tri- and pentachlorphenate, various organic mercurials, and borax. Dip treatments of softwood timbers such as pine in solutions ranging in concentration from ½ to 3 percent, depending on the chemical and the timber species, have given very effective sap stain control for periods of several months under very severe conditions.

Timber Seasoning

Quite apart from the fact that, for many purposes, timber must be properly dried before it is put into use if it is to give satisfaction, there are some timbers for which it is essential that drying should be carried out as soon as the timber is sawn if degrade due to staining is to be avoided. This is the case with many of the timbers of the region and a striking example of the value of such treatment is to be found in Ramin (*Gonystylus* spp.). In North Borneo this timber was, until recently, regarded as a "wood" tree because of the rapid staining of the timber after sawing. Now it is being exploited satisfactorily, primarily due to recognition of the need for seasoning the timber immediately after sawing.

It is suggested that the potential value of many such species throughout the region is such that, for this reason alone, this conference should stress the need for the improvement and development of seasoning practice in those countries where this aspect of utilization has been neglected.

There can be no doubt that as an industrial process the practice of timber seasoning is to be strongly recommended. The tremendous advances in the development of Australian timbers over the past twenty years could not have taken place without the accompaniment of an increase from a mere handful of timber seasoning kilns to the present total of approximately one thousand, the adoption of better kiln design, and the training of kiln operators.

Not only will the development of facilities for rapidly drying sawn timber enable the marketing of many species not now marketable to be undertaken, but the establishment of good seasoning practice will result in a major improvement in the quality of such manufactured products in timber as joinery, household furniture, fittings, implement parts, many types of cases and boxes, plywood, etc.

No major change in any of the traditional methods used in seasoning tim

[2] 1,000 super feet roundwood = 4.53 m^3(r)
1,000 super feet sawn wood = 2.36 m^3(s)

ber, namely, (a) air-drying, (b) kiln-drying, or (c) a combination of air-drying and kiln drying, is likely to occur in the near future. There should be wide scope and need in the region for each of the methods listed.

For species not prone to stain rapidly, particularly in the thicker sections, air drying is convenient and requires little capital expenditure in plant or equipment. Timbers of this type are usually the more impervious slower drying ones, with little sapwood present.

For species which tend to stain rapidly, kiln-drying as soon as possible after sawing is warranted and can be carried out economically in modern forced circulation kilns. The process is independent of weather conditions.

Combined air and kiln seasoning is an advantage where impervious timbers, or collapse-susceptible species, are being handled. It combines the advantages of both air- and kiln drying.

Of some importance in the exploitation of species from tropic, subtropic ,or warm temperate zones may be the recognition that collapse may occur in the timber of some of these species during drying. This phenomenon, caused by the collapse of the lumen of wood cells, may cause distortion, corrugation or excessive shrinkage during drying.

It has been established in Australia that this excessive shrinkage may amount to as much as 25 percent of the green dimension of the sawn section.

It has been demonstrated, however, that collapse can be permanently removed by a simple steaming treatment of a few hours' duration. This treatment is now a standard commercial practice in Australia where the collapse-susceptible timbers are milled. The practice has lifted the utilization quality of the collapse-susceptible "ash" eucalypts of Southeast Australia from a low grade standard to one of high value.

In any survey made of the characteristics or properties of timbers of the region, a study of the collapse susceptibility of the species should undoubtedly be included. Forest products research organizations can provide major assistance to the timber industry by investigating seasoning properties of their native timbers, making results available to industry on the technique of timber seasoning. The Division of Forest Products of the C.S.I.R.O. (Council for Scientific and Industrial Research Organizations) has played a large part in development of timber seasoning in Australia and would be glad to pass on to other countries of the region the benefit of the experience so gained.

Yearbook of Forest Products Statistics—1950

THE fourth Yearbook of Forest Products Statistics to be prepared by the Division of Forestry and Forest Products contains new information for the year 1949 and revised data for 1948 provided by more than 100 countries and territories.

The 1950 Yearbook estimates the world output of roundwood for 1949 at around 1,400 million m^3 (r). This is about the same as for 1937 but slightly less than the latest estimate for 1948.

By weight, the world roundwood output is greater than that of any other raw material except coal. The value of the 1949 roundwood output in the rough state may be set at about US$9,000 million; further manufacture into lumber, plywood, pulp and paper, and many other products increased this value by US$8,500 million.

Estimated regional shares of world roundwood output in 1949 are as follows:

Region	Roundwood output	Percentage of world total
	Million m^3 (r)	*Percent*
U. S. and Canada	361	26
Asia	300	22
U.S.S.R.	269	19
Europe	265	19
Latin America	132	9
Africa	51	4
Oceania	19	1
	1,397	100

The above figures are tentative. Experience with international forest products statistics during the past four years has revealed the need for the improvement of national statistics and for wider agreement upon reasonably comparable definitions. Gradual progress is being made in this direction.

The countries reporting to FAO in 1949 produced some 56 percent of the estimated world output of roundwood. About 43 percent of the reported roundwood output was utilized as fuelwood, some 37 percent as sawlogs and veneer logs, 13 percent as pulpwood, and the remaining 7 percent for miscellaneous products. Taking into account nonreporting countries also, the estimated world output of roundwood may be broken down by end uses into fuelwood 57 percent, lumber 23 percent, wood pulp 8 percent, and miscellaneous products 12 percent.

World roundwood output is about equally divided between hardwood (broad-leaved) species and softwood (coniferous) species. The greater proportion (74 percent) of the reported hardwood output for 1949 was utilized as fuelwood, whereas 81 percent of the softwood output was processed into lumber, pulp, and other industrial products.

WORLD TRADE

International trade statistics are more readily available and more reliable than statistics of output and utilization. Export figures for 1949 reported to FAO represent in equivalent volumes of roundwood about 87.5 million m^3(r) or about 11 percent of the total roundwood output of the reporting countries.

The principal exporting areas of the world are North America and Northern Europe, followed by Central Europe, South America, Asia, and Africa. In 1949 Sweden exported the equivalent of 46 percent of its total roundwood output, Canada 38 percent, Finland 37 percent, and Norway 31 percent. The exports of the United States, which in the aggregate are considerable, still represented only 2 percent of total output.

The main importing areas of the world are North America and Western Europe, including Germany. The 1949 imports of the United States, the major importing country, were equivalent to around 32 million m^3(r) or 36 percent of the roundwood equivalent of reported world imports, and those of the United Kingdom to about 21 million m^3(r) or 24 percent.

From the data reported to FAO, it appears that North America was the only net surplus region in 1949. The balance of trade by regions expressed in roundwood equivalents is as follows:

	Net balance*
	Million m^3(r)
Europe	−0.6
North America (excl. Mexico)	+6.2
Latin America	−0.8
Africa	−1.3
Asia	−1.7
Oceania	−1.7

*Exports +, imports −.

The areas of origin of all reported 1949 exports of lumber and wood pulp, the two major primary forest products entering international trade, are as follows:

Origin	Lumber	Wood pulp
	Percent	
Europe	52	69
U. S. and Canada	34	31
Latin America	7	—
U.S.S.R.	4	—
Africa	1	—
Asia	1	—
Oceania	1	—
	100	100

For 1949, the total value of all exports of forest products reported to FAO was US$2,500 million. Reported exports for 1948 totaled US$2,800 million. Exports of pitprops, softwood lumber, plywood, wood pulp, and newsprint in 1949 exceeded 1948 levels. On the other hand there was a decline in reported exports of sawlogs, hardwood lumber, and pulpwood.

Average export values of various commodities shipped in 1949, calculated from reported data, are:

Commodity	Unit	Export value
		US $
Softwood lumber	Standard	158
Hardwood lumber	Cubic meter	62
Plywood	Cubic meter	173
Wood pulp	Ton	110
Fiberboards	Ton	131

WOOD CONSUMPTION

The figures given in Table 42 of the Yearbook serve to indicate the relative rates of wood and wood products consumption in various countries. The following table (p. 179) shows the average annual consumption per person of wood and its products expressed in terms of roundwood during the years 1947-49, in

AVERAGE ANNUAL CONSUMPTION OF WOOD AND WOOD PRODUCTS

	Total roundwood	Fuelwood	Industrial wood
	($m^3(r)$ *per caput*)		
New Zealand	1.90	0.46	1.44
Switzerland	1.10	0.38	0.72
Denmark	0.81	0.18	0.63
Uruguay	0.99	0.63	0.36
Malaya	0.27	0.11	0.16
WEIGHTED AVERAGE:	0.87	0.30	0.57

five countries which are widely separated geographically, have limited forest resources, and are of average prosperity when judged by the standards of neighboring countries.

It would appear, then, that a reasonable average rate of consumption to use for calculating requirements on a world scale might be 0.9 cubic meters of roundwood per person, about one-third in the form of fuelwood and two-thirds converted into lumber, plywood, fiberboard, paper and other wood products.

On the basis of this average figure, the attainment of higher standards of living in many countries and continents obviously calls for a substantial rise in the supply of wood in all its forms. This need is greatest in the Far East and the Near East, but it exists also in such regions as Latin America and parts of Eastern Europe.

LUMBER

Production

World production of lumber in 1949 is estimated at about 197 million $m^3(s)$, an increase of about 2½ percent above the 1948 estimate of 192 million $m^3(s)$. A decrease of 11 percent in output in North America, where about 45 percent of the world's lumber production is centered, was more than offset by an 11 percent increase in European production and smaller increases in the U.S.S.R. and other areas.

Regional levels of production in 1949 compared with prewar are as follows:

	Index: 1937=100
U. S. and Canada	126
Europe	88
Asia	88
Latin America	110
Australia and New Zealand	169

The lumber production for 1949 of countries reporting to FAO amounted to 154 million $m^3(s)$, about 4 percent less than in the previous year. Softwood (coniferous) lumber accounted for 78 percent of this total, about 25.6 million standards.

World trade in lumber

The total of reported lumber exports for 1949 was 5 percent above the comparable figure for 1948, despite a 14 percent decrease in exports from Canada and the United States.

The volume of lumber reported as moving in international trade in 1949 represents about 14 percent of the reported softwood (coniferous) lumber production and some 6 percent of the reported hardwood (broadleaved) lumber production. Lumber represented 25 percent of the value of all reported exports of forest products.

About 61 percent of the international trade in lumber reported for 1949 took place within the two principal lumber consuming regions, Europe and North America. Eight percent of international lumber trade was made up of shipments from Canada and the United States to Europe, and 6 percent of exports from the same sources to other regions of the world.

Imports reported as originating in the U.S.S.R. in 1949 totaled 650,000 $m^3(s)$ or 140,000 standards, compared with 450,000 $m^3(s)$ or 95,000 standards in 1948.

Exports. The volume of exports reported for 1949 is 18.1 million $m^3(s)$, of which 16.4 million $m^3(s)$ or 3.5 million standards were softwood (coniferous) lumber. The latter figures compare with softwood exports of 3.3 million standards reported for 1948.

About 90 percent of all softwood (coniferous) lumber exports reported for 1949 originated in Canada, the United States, Austria, Finland, Sweden, Yugoslavia, and Brazil. These lumber exports were distributed as follows:

Destination	*Percent*
Europe (excl. U.K.)	30
United Kingdom	27
U. S. and Canada	22
Latin America	7
Africa	6
Oceania	4
Asia	2
U.S.S.R.	2
	100

Imports. Shipments of lumber for 1949 into some principal importing countries are compared with prewar totals in the following table:

	1949	*1937*
	(*Thousand $m^3(s)$*)	
United Kingdom	5,793	12,270
Netherlands	1,581	2,840
Germany	332*	2,340
United States	3,728	1,630
Japan	19	1,240
Belgium	494	1,160
France	465	1,060

*Bizone only.

Lumber stocks

Lumber stocks in countries which were able to give figures had increased by 1.6 million $m^3(s)$ at the end of 1949. Stock levels decreased in Sweden, United States, and Japan, but increased in Austria, France, Germany (Bizone), Netherlands, Switzerland, and Canada .

Consumption

Apparent lumber consumption of reporting countries for 1949 was 151 million $m^3(s)$, about 2 percent below the 1948 figure. Consumption in North America apparently dropped 7.25 million $m^3(s)$ from 1948, but consumption in reporting countries of Europe increased 2.5 million $m^3(s)$ and in each of the other regions by about 0.4 million $m^3(s)$.

Table 42 gives average figures over the years 1947-49 for lumber consumption per person in reporting countries. Such figures are useful for comparative purposes. Examples of consumption rates for various countries are given below:

	Per caput consumption
Canada	0.[illegible]
New Zealand	[illegible]
U. S.	[illegible]
Sweden	[illegible]
Australia	[illegible]
Finland	[illegible]
United Kingdom	[illegible]
France	0.12
Japan	[illegible]
Chile	[illegible]
Venezuela	[illegible]
Portugal	[illegible]
Brazil	[illegible]
Philippines	[illegible]
Southern Rhodesia	[illegible]

PLYWOOD

The production of plywood for 1949 in countries reporting to FAO totaled 3.4 million m^3, an increase of 9 percent over the total for 1948. Expansion of this industry has been marked during the last ten years. Five countries, the United States, Canada, Finland, Germany, and Japan, accounted for 81 percent of the output reported for 1949.

Exports reported for 1949 were about the same as for 1948, and were distributed as follows:

Destination	*Percent*
Europe (excl. United Kingdom)	25
United Kingdom	1
Canada and U. S.	3
Latin America	5
Asia	11
Africa	6
Oceania	3
Other areas	4
	100

SLEEPERS

Sleepers are not given separate treatment in the production and trade statistics of many countries. Production of sawn sleepers in France increased in 1949 by 160,000 $m^3(s)$ over 1948, and in both Germany (Bizone) and Brazil by 40,000 $m^3(s)$. It declined by 94,000 $m^3(s)$ in Italy, by 120,000 $m^3(s)$ in Japan, and by 436,000 $m^3(s)$ in Canada.

Imports into the United Kingdom were 276,000 $m^3(s)$ in 1948 and 319,000 $m^3(s)$ in 1949, compared with an annual average for the years 1936-38 of 540,000 $m^3(s)$. Other large importers in 1949 were Belgium with 84,000 $m^3(s)$, and the Netherlands with 53,000 $m^3(s)$. Export data for some important exporting countries are as follows:

	1949	1948	1936-38 Average
	(*1,000 $m^3(s)$*)		
France	96	33	93
Yugoslavia	71	78	90
Canada	128	233	92
U. S.	216	234	173

PITPROPS

Available data on production for 1949 indicate that output was about 8 percent less than in 1948. Reported imports totaled 4.2 million $m^3(r)$ or about 2 percent less than for 1948. Although there is limited international trade in other regions, the main importing area is Western Europe. The principal sources of export supplies in 1949 were Finland, Canada, Sweden, Portugal, Yugoslavia, France, and Norway, in that order.

VENEERS

The value of reported exports in 1949 was US$18.2 million, slightly less than 1 percent of the value of all reported trade in forest products. France was the largest exporter, followed by Canada, Yugoslavia, United States, and Italy. The United Kingdom, United States,

Netherlands, and Belgium were the principal importers.

Staves and Barrels

Reported exports for 1949 totaled US$11.7 million in value. The principal exporters were: the United States US$5 million, Iran 1.6 million, Finland 1.1 million, Italy 0.9 million, Canada and Brazil 0.7 million each, and Sweden 0.5 million. Imports of the United Kingdom were valued at US$2.7 million, Canada 0.9 million, Ireland 0.7 million, and the United States 0.5 million. Reported 1948 imports of the British West Indies were US$1.8 million and of Venezuela 0.9 million.

WOOD PULP

Production of wood pulp

World production of wood pulp in 1949 is estimated at 28.4 million metric tons, about 2 percent less than the figure of 28.9 million tons computed for 1948.

Figures of production for 1949 reported to FAO totaled 25.8 million tons, covering the major manufacturing countries. The breakdown of this total by grades is:

	Percent
Mechanical	34
Sulphite	29
Sulphate	30
Other grades	7

Percentage shares in total world production of wood pulp in 1949 and 1937 are as follows:

	1949	1937
	(....*Percent*....)	
United States	39	24
Canada (incl. Newfoundland)	25	20
Sweden	10	14
Finland	6	9
Norway	3	4
Germany	3*	10
Other countries	14	19
	100	100

*Bizone only.

World trade in wood pulp

There was a 5 percent increase in the volume of wood pulp exports reported for 1949 compared with 1948. Canada's exports decreased from 1.6 million tons in 1948 to 1.4 million tons in 1949, 84 percent of the latter going to the United States. On the other hand, European exports increased by 430,000 tons in 1949 from the previous year, those to other European countries increasing by 366,000 tons, to South America by 86,000 tons, and to Asia by 40,000 tons. Exports to North America decreased by 200,000 tons, and to Oceania by 20,000 tons.

The value of wood pulp exports reported for 1949 amounted to US$538 million, accounting for 22 percent of the value of all reported forest products exports. The United States with 1.6 million tons in 1949 remained the largest single importer, followed by the United Kingdom with 1.34 million tons. The general pattern of trade in wood pulp is shown by the following table:

Destination	Origin: Canada and U. S.	Origin: Northern Europe
	(.....*Percent*.....)	
U. S.	78	15
Latin America	1	7
Europe (excl. U.K.)	6	40
United Kingdom	11	34
Asia	1	2
Africa	*	*
Oceania	*	1
Other areas	3	1
	100	100

*Less than one-half percent.

Consumption of wood pulp

Most of the world's wood pulp is consumed in Europe and North America. Relative levels of consumption of pulp products over the years 1947-49, in terms of kilograms of wood pulp per person, are shown by the following figures:

	Kg. per caput
U. S. and Canada	112
Sweden, Finland, Norway	72
Australia and New Zealand	43
Belgium, Denmark, Switzerland, U.K.	30
Austria, France, Ireland, Netherlands	19
Chile, Uruguay, Venezuela	9
Ceylon, Japan, Philippines	5
Egypt, Morocco, Tunisia	1.8

One of the more promising economic developments which, it is hoped, will be encouraged under FAO's Expanded Technical Assistance Program is the conversion of nearly all kinds of wood, including tropical hardwoods, into pulp for the manufacture of pulp products. The present plainly inadequate supply of wood pulp in many parts of the world might then be changed.

Newsprint

Production of newsprint in countries reporting to FAO increased 7 percent in 1949 over 1948 to 7.4 million tons. This compares with an estimated world production of 7.8 million tons in 1937.

Export of newsprint in 1949 totaled 5.2 million tons, a rise of 13 percent over the volume for 1948. All the principal exporting countries reported rising exports, but the greater portion of the increase resulted from larger Canadian exports to the United States. Newsprint exports represented 22 percent of the total value of all reported international trade in forest products in 1949.

Fiberboards (Building boards)

The reported world production of fiberboards, both hardboard and insulating board, in 1949 was 1.5 million tons, a decrease of 300,000 tons from 1948.

Reported fiberboard exports for 1949 totaled 210,000 tons, which represents 14 percent of reported production. The major exporters in 1949 were Sweden (98,000 tons), Canada (32,000 tons), United States (21,000 tons), and Finland (31,000 tons). The largest importers were Canada (43,000 tons) and the United Kingdom (37,000 tons).

An interesting collection of stamps issued by some of the countries that participated in the Third World Forestry Congress held at Helsinki last year. Reproduced by courtesy of Pinhal e Resina, the quarterly review published by Junta Nacional dos Resinosos, Lisbon, Portugal.

News of the World

The items appearing here are condensed selections of news thought to be of interest to readers of UNASLYVA. *They are grouped alphabetically by countries under hearings currently used by the Division of Forestry and Forest Products for reference purposes. The Editor will be glad to receive direct from readers authenticated items of interest and of news value for this part of the review.*

General

AUSTRALIA

• The Forest Products Laboratory of the Council for Scientific and Industrial Research, Melbourne, is making its facilities available to several holders of UNESCO fellowships interested in forest products investigations. Two specialists from Pakistan and two from Malaya are at present working with the staff of the Australian Laboratory.

BULGARIA

• Bulgaria, judging by area, is a well-wooded country. Some 33 percent of its territory or close to 3,000,000 hectares are covered with forest. Yet, apparently, the country is experiencing a serious shortage of wood for construction purposes and fuel. Before the war, 16 percent of the forests belonged to the State, 59 percent to communities (including monasteries), and 25 percent to private individuals or corporations. Forests, irrespective of ownership, were greatly overcut especially in readily accessible regions where annual cut was up to double the annual growth. What saved the Bulgarian forests from more serious damage is the fact that two-thirds of the forests consist of broadleaf species capable of regeneration from coppice shoots. The prevailing species in these low forests is oak (50 percent); beech, hornbeam, plane, and elm also occur in varying quantities. The few remaining high broadleaf forests consist of beech—both European and Oriental (*Fagus sylvaticus*). Conifers such as pines and juniper form only 30 percent.

Before the war, timber accounted for 0.3 percent of the country's exports. Under the 1947 constitution, all forests were declared national property. A Ministry of Forests was created in 1949. The forests were divided into 26 regional directorates embracing 260 forest units responsible to the Central Organization. The timber industry is at a low level because: (1) of lack of roads and streams for transportation purposes, (2) much of the forest is in mountainous regions, and (3) the principal tools in the forest industry still are the axe and the hand saw. The Ministry of Forests hopes to increase the annual output of constructional timber to 2,280,000 m³ by 1953 (228 percent above 1939) with all necessary safeguards for regeneration and improvement of the stands. Some 800,000 hectares must be reforested in order to protect the land from the effects of rainfall erosion. During the period 1949-1953 67,000 hectares are to be reforested and 52,000 hectares of badly depleted forests are to be brought into better growing condition.

There is a Forest Research Institute in Sofia, and at the Agricultural Academy in Sofia a department of forestry has been established. A number of technical schools for training qualified personnel of lower grades have been opened.

CANADA

• Canadian forest schools graduated 317 forestry students in the spring of 1950, bringing to 1,500 the total number of professionally trained foresters in the country. This number is still about 1,000 short of the force believed necessary to provide proper management for the 521 million acres (211 million ha.) of productive forests. The shortage of foresters is accentuated by the fact that there are only 35 foresters dealing with the problems of wood lots, although there are 600,000 small privately owned forests.

GERMANY

• A Working Group on Forest Genetics and Plant Breeding has been created with the following aims: (1) advancement of knowledge in the whole field of the breeding of forest trees; (2) co-ordination of experimental investigations; (3) dissemination of the results of research in close collaboration with practice so that they can be of practical use; (4) advice to government and private forest administrations; and (5) protection of the interests of the scientists engaged in work connected with the breeding of forest plants. All scientists working in this field in Germany have joined the group.

INDIA

• "The proper utilization of forest wealth must be an important part of our national policy, if we are to succeed in increasing national prosperity." This was the theme of the Convocation address to the Forest Colleges and Forest Research Institute in Dehra Dun recently by Sardar Vallabhbhai Patel. In the course of the address the Deputy Prime Minister of India further said: "Our watch word should be that we create more than we destroy, and turn all our cultivable area suitable to be brought under forests into lands yielding either valuable forest wealth or performing the useful function of sentinels against the forces of elements, water, weather and sands. . . . The history of denudation of the forest resources of this country is replete with instances of cruel exploitation of this vital national wealth and criminal waste of capital placed in our hands by a bountiful Nature. Planned exploitation of such resources, based on the principle of preservation and replacement, is a feature of comparatively recent date. Obviously, we cannot make up the leeway of centuries, but we can by judicious planning and lay-out still husband the resources that are available and create wealth which, in course of time, may achieve that balance between afforestation and clearance which is the hallmark of scientific planning."

UNITED STATES OF AMERICA

• A technical mission organized by the Organization for European Economic Co-operation has been visiting the U.S.A. to study silviculture; forest exploitation and timber transport; organization and techniques of the sawmill industry; plywood, veneer, and board industries; conditioning and marketing of timber; and tropical timbers. The mission, comprised of representatives of a number of European countries, split into five study groups. On their return to Paris, they prepared reports for OEEC.

Fundamental Science

UNITED STATES OF AMERICA

• The Institute of Forest Genetics of California has succeeded in germinating several seeds derived from the fertilization of flowers of the *Pinus lambertiana* with pollen of *Pinus Armandi* and *P. koraiensis*. In 1947, four apparently filled seeds were obtained, but despite a special treatment (embryo culture), no germination ensued. In 1948, another method of treatment was tried on seven apparently sound seeds derived from the crossing of the sugar pine with *P. Armandi*, and one apparently sound seed obtained from a

cross with *P. koraiensis*. All the seeds thus treated germinated; two of the plants obtained from the crossing with *P. Armandi* died during the first winter, but all the others are growing normally. They appear to be true hybrids because (1) they produced needle fascicles during the first summer, and (2) the dorsal surface of the needles have no stomata, a characteristic of *P. Armandi* and *P. koraiensis* but not of the sugar pine. Obtaining hybrids of these species is of great interest because the sugar pine is susceptible to blister rust attacks (*Cronartium ribicola*), whereas the Asiatic white pine species, with which crosses were attempted, are resistant to this disease.

Silviculture and Management

CANADA

• Responsibility for some of the recent flood disasters at Winnipeg is found to lie in forest abuse. About one-third of the drainage area of the Red River in the North is forested mostly with spruce, and the thin soil forms a scant cover for the underlying rocks. Large areas of this have been clear-cut and the forest soil burned, thereby inducing rapid snow melt and rapid runoff. Additional areas of the Red River in northern Minnesota, U.S.A., have also been abused by clear-cutting and burning forest areas.

• A comprehensive analysis has recently been made of the large number of experiments in direct seeding in the southern coastal region of British Columbia during the period 1923-49. An extensive area, more than can be covered by planting, is in need of reforestation because of past losses through fire and logging. Experiments have been conducted with Sitka spruce (*Picea sitchensis*), western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), and Douglas-fir (*Pseudotsuga taxifolia*). The latter is by far the most important species. However, the experiments showed that direct seeding would not be successful until some form of protection could be given to the seed against the deermouse (*Peromyscus*). Various control measures have been investigated, including physical barriers, poisons, and repellents. The screening of seed spots is the most promising, but is too expensive. Wide distribution of poison also has serious disadvantages, and as yet no effective method has been discovered for the application of repellents. In the case of hemlock, cedar, and Sitka spruce, rodent control would not appear so important and some success was attained when these species were sown on suitable sites.

• Improved techniques applied in the three major forest nurseries operated by the British Columbia Forest Service have now reduced the cost of trees ready for shipment to one-third of a cent (Canadian) apiece, including charges for capital investment. Major steps which have been applied include: (1) weeding by a high-pressure blow torch which kills the weed, but does not damage tree seedlings, (2) machine pruning of roots of the seedlings at the end of the first year of growth, and (3) denser stocking of seedbeds which increases the output per man-day in lifting of seedlings.

• The tolerant hardwood-softwood forest of Eastern Canada was the cradle of the Canadian forest industry. First, softwood logging operations removed most of the softwood species, and more recently high-grading of the more valuable hardwood species and trees has left large areas on which defective or otherwise unmarketable overmature hardwoods occupy most of the crown canopy and retard the growth of desirable younger trees. Thus, large areas have been reduced to a state of very low productivity. Beginning in 1936, research was initiated to determine ways to bring these non productive areas back into production of timbers of commercial value through removal of wolf trees and thinnings. In one particular experiment, three transect plots were laid out, each covering the three site-types encountered: (1) the *trillium-vibernum* type which occurs on the deeper and richer soils of the lower slopes and the valleys; (2) the *mitchella-aster* type of the upper slopes; and (3) the *aster-gaultheria* type on the thin-soiled hilltops. The first plot had work limited to one man-day per acre, chiefly in girdling of wolf trees. On the second, all desirable work was done, amounting to about two man-days per acre, and the third plot was left as a control. Species were favored in the following order: yellow birch (*Betula lutea*), hard maple (*Acer saccharum*), basswood (*Tilia glabra*), oak, and white birch (*Betula papyrifera*). Desired stocking was set at 500 stems per acre. Detailed records of changes in stand composition, tree condition, stand condition, and net increment per acre have been obtained by detailed examinations. Response to treatment has been good in all three site-types of the plot which was heavily treated, being best in the valleys and least effective on the ridges. The desired species on the lightly treated plot also responded to treatment although less so than on the heavily treated plot. At the same time on the controlled plot little growth of potential commercial timber is being obtained, and without treatment it would be a very long time before another commercial cut is available. The bottom type is the only one of the three suitable to yellow birch, but hard maple responded well on all three site-types. At present it is highly uncertain whether treatment of deteriorated stands on ridge tops will be justifiable.

CYPRUS

• The campaign to establish Village Fuel Areas has met with outstanding success. To date there are 80 such plantations covering an area of 5,000 acres (2,000 ha.). By establishing Village Fuel Areas for villages in the fuelless plains, pressure is taken from the mountain and hill forests where the villagers would usually obtain their essential needs of fuel. While the present fuel plantations are far from sufficient, they are serving a very valuable function in showing that otherwise worthless lands available to villages may be made to produce their fuel needs. Owners of such fuel plantations have shown a lively appreciation of their value and have protected them against trespass and depredation, even though they are generally unfenced and unguarded. Trespassing on the State forests, on the contrary, is still common since the people have not yet realized their own stake in these public properties.

FRENCH WEST INDIES

• Experience in reforestation with *Swietenia macrophylla* in Martinique dates from 1905 when the first plantation of Honduras mahogany was made. Optimum space for field planting is 3 by 3 meters and success of plantings depends largely on proper care during the first year, although weeding of plantations three times a year during the first five years is required to free young trees from vines which may hinder their growth. Thinning normally starts at the age of five or six years. Growth in height is about 13 meters at 10 years of age and 22 meters at 25 years. A tree 35 years old yields 35 planks, each 2 meters long, 0.25 meters wide, and 0.07 meters thick. Four-fifths of the trees should be well-developed with proper care in a plantation of 1 hectare at 3 meter spacing.

INDIA

• The *Vana Mahotsava* or Great Forest Festival is to be celebrated annually in July. In 1950 the Union Agriculture Minister set a goal of 10 million trees to be planted. In his call for the peoples' co-operation, the President said, "The duty of the public at this juncture is obvious. They must co-operate with the Government in a common endeavour not only to rehabilitate our denuded forests, but also to plant trees wherever necessary and nurture them properly in order that they may grow into usefulness to the people and future generations, and regain the colour and beauty of our ancient land."

UNION OF SOUTH AFRICA

• At present there are over ½ million acres (200,000 ha.) under wattle, of which Natal has about 400,000 acres (160,000 ha.). The value of the bark and tanning extract was over 2 million pounds sterling in 1945. Black wattle (*Acacia mollissima*) is by far the most important species. The main plantations in Natal are confined to the mist belt at altitudes of 2,000 to 4,500 feet (600 to 1,400 m.) with a mean annual rainfall of over 35 inches (89 cm.). Soils vary from sands to loams, but all are deficient in humus. Rotations are very short and from eight to ten years is the rule. At ten years of age, average height on second quality sites is about 63 feet (19.2 m.) and mean D.B.H. is 6.6 inches (17 cm.), whereas on first quality sites, average height is about 80 feet (24.4 m.) and average D.B.H. 8.6 inches (22 cm.). About 12 tons of green bark per acre (30 tons per ha.) are obtained by harvesting at ten years, using clear-felling. The final stocking is about 400 stems per acre. Although originally broadcast burning of regenerated areas to stimulate reproduction was practiced, present policy avoids burning, but insists on early and heavy thinnings. Burning was found to decrease soil fertility and to stimulate or induce erosion, as well as stimulate excessively dense natural reproduction and destroy some of the organisms which help in the natural control of bagworm (*Thyridopteryx ephemeraeformis*), a great pest on wattle. The aim of present management is to produce pure, even-aged crops grown on short rotation and clear felled, with the log debris scattered to prevent soil erosion.

United Kingdom

• The latest booklet in the Forestry Commission's series "Britain's Forests" describes the Kielder Forest of approximately 74,000 acres (30,000 ha.) where 23,361 acres (9,454 ha.) have so far been planted out of a plantable area of about 42,000 acres (17,000 ha.) and where planting is proceeding at a rate of 3,000 acres (1,200 ha.) a year with 50 percent Sitka spruce (*Picea sitchensis*), 40 percent Norway spruce (*P. abies*), 5 percent Scots pine (*Pinus sylvestris*), 3 percent Douglas fir (*Pseudotsuga taxifolia*), and 2 percent others. Thinnings are already yielding material for farm and forest fencing and will soon produce pitwood for collieries in Northumberland and South Scotland. The area is mainly peat moorland and the area now shows the development of "turf planting" in all its stages. Each tree is planted in a square piece of overturned turf cut from drains required to dry out the moor. A recent development is the use of a large tractor drawn plough to cut the actual drain: this plough places the peat in a long continuous roll along the drain making it a simple matter to cut out the turfs and spread them at the required distance of about five feet apart. The main problems in this forest are protection against fire and the maintenance of efficient drainage. The area will eventually contain five well-planned forest villages intended to provide homes for some two thousand forest workers.

United States of America

• An example of the interest displayed by wood-using industries in replanting forest lands on which they depend for their raw material supplies is furnished by the pulpwood industry of the Southern States which has this year, for the second consecutive year, planted over 60,000 acres (24,000 ha.). This year this industry has replanted 42,000 acres (17,000 ha.) owned by the pulpmills and provided seedlings for the replanting of 1,500 acres (600 ha.) belonging to other pulpwood producers. It has also provided seedlings for the afforestation of 18,000 acres (7,300 ha.) of worn-out or idle forest and farm lands.

• The problem of obtaining proper distribution of natural seedfalls for regeneration of sugar pine (*Pinus lambertiana*) in California has always been exceedingly difficult because of the large size of the seed. Due to this fact it falls rapidly and, with a wind velocity in the forest of 10 m.p.h. seed falling a vertical distance of 100 feet (30 m.) would fall only 169 feet (52 m.) horizontally; such wind velocities are not common. The distribution for a radius of 105 feet (32 m.) from seed trees was found to be at the rate of over 21,000 seeds per acre (52,000 seeds per ha.), whereas beyond that distance up to over 200 feet (60 m.) the rate was only about 4,000 seeds per acre (19,000 seeds per ha.). Very large numbers of seed are required to obtain established seedlings, since, for example, a seedfall at the rate of 29,000 per acre (72,000 seeds per ha.) produced seedlings only at the rate of 700 per acre (1,700 per ha.) and seedfall at the rate of 10,600 per acre (26,000 per ha.) produced only 139 seedlings (343 seedlings per ha.). The uncertainty of stocking by natural seedfall even after soil preparation and control of rodents indicates the probable desirability of artificial regeneration where the establishment of sugar pine is important.

Union of Soviet Socialist Republics

• As the energies of many foresters in the U.S.S.R. are now largely engaged in actual afforestation operations, especially in the prairie regions, it is natural that current silviculture literature should be devoted to problems connected with this work—collection and storage of seed, production of the largest number of seedlings per hectare in forest nurseries, highest percentage of yield of survival of seedlings planted in the field. T. D. Lysenko has recently issued a set of rules for the collection, storage, and pregermination of acorns for direct sowing in the field. There is a growing trend, initiated by Lysenko, to establish plantations, especially of oak, by direct sowing of the acorns instead of using seedlings. As an essential condition for establishing oak plantations by direct sowing, it is recommended that the acorns be sown as early as possible in the spring and that they should be in a state of initial germination, swollen and ready to burst. To get the acorns into the necessary state of pregermination, they must be spread out immediately after their collection in trenches 1 meter deep by 1 meter wide in layers of one to two acorns, alternated with thin layers of soil of normal moisture content 1 to 2 cm. thick. The trenches should be filled with these alternating layers up to 20 cm. from the top. This remaining 20 cm. is filled with soil only. To protect the trenches from autumn rains, the soil is heaped up slightly above the level of the surrounding area. When the frosts arrive, additional earth is piled on the top and edges of the trenches to protect the acorns from freezing. Acorns should not be sown in the field in the autumn as this will result in many being killed by frost or destroyed by rodents. The acorns stored in the trenches usually begin to swell during the winter. During the course of the winter, and especially during the period of a month or a month and a half before spring arrives, samples of acorns should be dug out to determine their state of dormancy. If a month before spring only a small percentage of acorns show any sign of starting to germinate, the trenches must be emptied and the acorns and the soil spread out in layers usually 15 to 20 cm. deep in a building with a temperature of 7 to 12° C. Such treatment will cause the still dormant acorns to start germinating and thus prepare them for sowing in the early spring. The object of pregermination and early sowing is to take advantage of moderate temperatures and favorable water and soil conditions in the early spring. By the time high temperatures and drought arrive in July and August, the roots of seedlings will have penetrated the soil to a depth of 1 meter and will then be capable of withstanding the summer heat and drought. It has been found that acorns that were sown late in the spring and which were not pregerminated produced seedlings whose roots had not even by the summer penetrated the superficial soil layer which becomes overheated and dry. As a result, such seedlings usually perish.

• Two years have passed since the U.S.S.R. embarked on its ambitious plan of transforming nature over an area of 120 million ha. (*Unasylva Vol. II, No. 6, p. 345*). In spite of many frankly admitted errors in the organization of the work and in the use of the proper technique, 1949 is claimed to have been, on the whole, a year of substantial progress. The planting of shelter belts around cultivated fields, for instance, had been carried out by the spring of 1949 on 167,000 hectares, thus fulfilling 89.5 per cent of the year's plan. The forest nurseries in the southeast and east have raised 3,000 million seedlings for planting in 1950. Apparently little has been done as yet on the actual planting of the 5,300 km^2 of the state protective forest zones beyond surveys, allocation of the land, and preparation of the ground. Some 22,000 tons of acorns and several thousand tons of seed of other trees and shrubs were collected. Great progress was made in establishing and equipping 54 tractor stations and a large number of state forest nurseries. All the new tractor stations were uniformly provided with several makes of large powerful caterpillar tractors, cultivators, plows, planting machines, trucks, movable water tanks, excavators, scrapers, movable workshops, and other tractor-drawn machinery. In 1950 the number of tractor-drawn or tractor-mounted machines was to reach 15,000. One of the main tasks of the tractor stations was to prepare the soil for planting in the autumn of 1949 and 1950. The plan for 1949 called for the preparation of 616,300 hectares of plow land. By September 1949, 491,400 hectares, or 80 percent of the entire year's plan, had been plowed and made ready for planting.

• Investigations in the broadleaf forests of Tula province have brought out some interesting facts regarding the effects of thinnings on the accumulation and thawing of snow. In broadleaf forests located on a plateau without pronounced features, both moderate and heavy thinnings increased the snow accumulation by 3 to 17 percent. On the other hand, by allowing more sunshine to reach the ground, they shortened the period of thawing in middle-aged stands by two or three days, and in young stands by three to five days. On southern, southeastern, and southwestern slopes heavy thinnings decreased the depth of the snow cover and the amount of snow water by 3 to 17 percent, increased the rapidity of snow thawing by 5 to 32 percent, and the depth to which the upper layers of the soil froze by 10 to 12 percent. The steeper the slope and the more southern the exposure, the more disadvantageous was the effect of thinnings upon the water regime. For these reasons, no heavy thinnings are to be allowed on steep southern, southeastern, and southwestern exposures, in broadleaf forests, especially in watershed protection forest or in woods bordering streams.

Uruguay

• An effective contribution to the afforestation of the country took place during the present year due to the President's request to Congress to pass a law dedicating 1950 to the memory of General José Artigas, national hero of the country, on the one hundredth anniver-

sary of his death, as "Year of the Tree to Artigas." It contains an extensive program of afforestation on public and private lands.

The acute problems created by depletion of the forests require the co operation of all citizens. Government officials, private individuals, and even school children are to help out in the campaign. Uruguay has the lowest per caput forest area of all Latin American countries and the effects of deforestation are heavily felt in agriculture, water and fuel supply, and many other aspects of national life.

Forest Protection

CANADA

• The prevalence of man-caused forest fires in Canada is leading to severe penalties being imposed by the courts when those responsible for starting fires are convicted. Recently not only fines and imprisonment have been imposed as penalties, but the culprits were assessed with the costs of suppressing the fire. It is hoped that the imposition of such severe penalties will compel users of the woods to practice greater care when they build fires for camping and similar uses.

• A new Dominion Laboratory of Insect Pathology located at Sault Ste. Marie, Ontario, is being established, and will be devoted entirely to the study of insect diseases in conjunction with several field establishments which will be established throughout Canada. It will have to deal with the disastrous forest insect attacks which now account for at least one-fifth of the total annual depletion of Canadian forests, first of all with the spruce budworm (*Cacoecia fumiferana*). If this forest insect can be permanently infected with a virus disease, great steps will have been taken to reduce the current losses.

UNITED STATES OF AMERICA

• Recent studies on the use of "wet-water" for forest fire suppression conducted by the California Forest and Range Experiment Station have shown that in comparison with ordinary water: (1) savings up to 23 percent in volume of water required and 13 percent in time of mop-up can be obtained if the "wet water" is applied with reasonable efficiency; (2) rekindling of fuel is reduced as much as 30 percent; (3) "wet water" is markedly superior in its ability to knock down flames quickly; (4) dead fuel along the burning edge of a fire remained wet up to 50 percent longer when sprayed with "wet water"; (5) fuels once treated with "wet water" and allowed to dry may be sprayed later with plain water with results comparable to an original spraying with "wet water." In general, indications are that wetting agents have a definite place in forest fire suppression, although further work is needed on the project.

• A comprehensive report on forest fires in the United States during 1949 showed that the number increased from 174,189 in 1948, to 193,774 in 1949, but that acreage decreased from 16,557,000 acres (6,701,000 ha.), to 15,397,000 acres (6,231,000 ha.). 83 percent of the total burned area was on unprotected forest land, whereas on protected areas only 0.46 percent of the total forest area was burned over. Comparing 1948 to 1949, lightning fires increased from 4,392 to 8,235; smoker fires from 14,988 to 17,447; camper fires from 3,064 to 4,165; debris burning fires from 11,101 to 16,466; and incendiary fires from 20,047 to 26,726.

• An eight-year study of cattle grazing in woodlands on the Coweeta Experimental Forest indicates that a 2-inch (5 cm.) storm now produces as much peak discharge, 23 cu. ft. per sec. per sq. mile (0.25 m^3 per sec. per km^2), as did a 3-inch (7.6 cm.) storm before cattle grazing was allowed and that a 3-inch storm now produces twice as much as it did originally. Turbidity of the stream from the area has increased greatly; it was originally clear. Trampling is largely responsible for these results, since porosity has decreased as much as 50 percent and permeability as much as 90 percent. Height growth of smaller trees of economically superior species has also decreased as much as 50 percent and the number of plants has decreased as much as 75 percent. It is pointed out that these effects are just beginning to show, and it is to be expected that there will be more pronounced effects as time goes on.

Mensuration, Increment, and Yield

GERMANY

• Two American experts loaned by the U. S. Forest Service to the Economic Cooperation Administration recently spent four months in West Germany to advise and assist the German administration on forestry surveying techniques, including sampling method procedure, methods of estimation, and analysis of the data. A sample area of 17,000 acres (6,900 ha.) was selected for demonstration, and at the end a sampling error of 3¼ percent with only 363 plots was obtained. The detailed knowledge of areas and stand classes already available made it far easier to apply samplying methods in this case than in the United States. The sampling method is under consideration for use in a survey of all West Germany, since, at the present rate of progress, the customary management surveys would not be completed for twenty years.

Logging and Engineering

MALAYA

• The need to open new forest areas has increased as a result of the war and Japanese occupation when unregulated working allowed many of the most readily accessible forests to be exhausted, and squatters, driven from the towns by the necessity to grow food, destroyed much of the forest adjacent to the roads.

Under the 1949 United Kingdom loan to Malaya funds have been made available for the construction of forest roads. Part of this has been spent on equipment which includes six caterpillar D6 tractors fitted with Hyster towing winches and hydraulic angle-dozers, a Diesel roller, scraper, mobile workshop, and transport. It is proposed to construct about 120 miles (190 km.) of roads and tracks during the next six to eight years, of which 70 miles (110 km.) will be all-weather construction 16 feet (4.9 m.) in width with strip metaling; the remainder will be logging roads made to a lower specification.

Conversion

UNITED STATES OF AMERICA

• A recent patent has been issued on a method developed at the Forest Products Laboratory, Madison, Wisconsin, for increasing the drying rate of wood. Several chemicals, including sodium bicarbonate, urea and ammonium carbonate may be applied in any one of several ways: by piling the green wood with solid chemicals between layers; by soaking in solutions of the chemicals; by painting, dipping, brushing, or otherwise applying the chemicals in a starch-thickened solution; and by pressure treatment. After the chemical treatment, the wood is kiln-dried in a conventional manner. The chemical treatment not only reduces the time for kiln-drying, but eliminates or minimizes water pockets and reduces the tendency of the wood to collapse in drying.

Utilization

UNITED KINGDOM

• De Havilland's jet-propelled fighter "Vampire" has been from the outset an all-wood structure: a molded and glued sandwich of birch plywood skins with a balsa core and with the structural members and smaller reinforcing parts in laminated Sitka spruce. The fuselage has proved equal to the stresses set up by the pressurization necessary for high altitude flying [in 1948 it set an international height record of 59,446 feet (18,119 m.)], to the damp heat of the Far East and temperatures as low as —45° F. (—42.8° C.) or even —100° F. (—73.3° C.) at high altitudes.

UNITED STATES OF AMERICA

• According to the 1949 report of the Northern Rocky Mountain Forest and Experiment Station, co-operative studies show that cattle rations containing wood molasses were as effective in producing weight gains as those containing cane molasses, and for sheep similar results have been obtained.

• Based on studies made in co-operation with the U.S. Forest Service in 1912, 1919, and 1928, and on a very careful investigation covering the year 1946, the New York State College of Forestry has compiled a complete list of the wood using establishments in New York State, the leading wood user in the U.S.A.

In 1946, there were 1,620 woodworking factories using 655 million board feet of timber [3 million $m^3(r)$]. There is a wide variety of factories with some at the top of their class; for instance,

manufacturers of tobacco pipes, pencils, baskets, and especially shoe lasts, and 282 furniture companies. This consumption study divides the firms into 59 classes of industries, each one of which is described, with tables showing the amount of wood used in it; the percentage grown in New York State, subdivided by species; and the thicknesses and grades of principal woods (with a special reference to veneer and plywood).

This type of study is of interest both generally and for producers. An interpretation of the material given in the study, supplemented by some additional data, appeared in the November and December 1949 issues of the *Industrial Bulletin*, published by the New York State Department of Labor.

Economics and Statistics

Australia

● It is reported that Australia is taking delivery of 1,000 prefabricated wooden houses from Swedish manufacturers. Swedish foremen and fitters will assemble the three and four-room houses in Australia, complete with all plumbing and electrical fittings, fully equipped kitchens, and bathrooms.

Austria

● Three pulp and paper mill projects which are expected to substantially benefit Austria's balance of trade, strengthen her domestic economy, and provide additional employment have been approved by the Economic Co-operation Administration. These projects are part of the recommendations of the FAO Mission for Austria (*Unasylva Vol. IV, No. 3, pp. 135-36*). The first project is for modernization of two mills. One of these factories is a fine paper mill and the other plant is a sulphite pulp mill. It is estimated that paper production will be increased from 8,000 to 17,000 metric tons annually and that pulp production will be increased from 10,000 to 16,000 metric tons. Total cost of this project is estimated at the equivalent of $2,647,000. Of this amount, $1,169,000 in ECA dollars will be used for purchases in the United States. The equivalent of $144,000 in German drawing rights, $75,000 in Italian drawing rights, and local currency equivalent to $1,259,000 will also be used for the project.

A second project involves replacement of two obsolete newsprint paper machines by the purchase and installation of one modern high-speed newsprint machine, together with the necessary auxiliary equipment. The total cost of the project amounts to the equivalent of $3,714,000, including $80,000 for ocean freight costs. Of this total, ECA financing for machinery and equipment will amount to $1,604,000. In addition, drawing rights for the equivalent of $549,520 were approved for purchases in Germany. Local currency to be expended is equivalent to $1,480,000. With the proposed improvements it is estimated that the plant production of newsprint, for which there is an increasing world demand, will be increased from 12,500 tons in 1949 to 30,000 tons in 1952. Through the erection of a new boiler plant and improved utilization of power, importation of black coal will be eliminated, saving approximately $250,000 per year.

The third project covers modernization of a completely integrated pulp and paper mill. Total cost of the project is estimated at the equivalent of $3,575,000. Of this amount, $1,129,000 will be financed by ECA for purchases in the United States. In addition, the project involves an equivalent of $221,743 in German drawing rights, $218,085 in Swedish kronor and $81,650 in Swiss francs. The local currency cost is estimated at an equivalent of $1,925,000. The proposed modernization is expected to increase the chemical pulp capacity from 26,000 to 30,000 metric tons per year and paper manufacturing capacity from 10,000 to 18,000 metric tons per year. The contemplated improvements in equipment and methods is expected to bring about this increased production without a significant increase in raw material consumption.

Brazil

● Between 20,000 and 40,000 standards of Paraná pine are being purchased on a barter basis, under the Anglo-Brazilian Trade Agreement of 1949, by the United Kingdom's Timber Control, against deliveries from the United Kingdom consisting partly of luxury goods. The price basis is reported to be £53 f.o.b. In British trade circles, satisfaction is expressed as to the fact that this timber can be supplied in 9 inch, 11 inch, and 12 inch widths.

Czechoslovakia

● During the five year period between 1949-53 Czechoslovakia plans to cut 55 million m^3 of timber; of this 40 million m^3 are conifers and 15 million m^3 broadleaf species. This cut is distributed as follows:

	Conifers (.. *Million*	*Broadleaf species* m^3 ..)
Round timber	24.0	3.2
Railroad ties	0.02	1.6
Mining timber	3.4	—
Telegraph poles, etc.	0.6	0.2
Other structural timber	0.1	0.4
Fuelwood	4.18	8.5

This represents an average annual cut of 11 million m^3. Since the annual growth is estimated at 13.5 million m^3 such a cut does not appear excessive. With a forest area of 4,000,000 hectares, the average annual growth per hectare would be 3.37 m^3, a considerably higher rate of growth than in some other central European countries. The plan further calls for reforesting by natural and artificial means within the next five years of 231,000 hectares or at the rate of some 46,000 hectares a year.

Finland

● A plant producing methanol from wood and sawmill waste, which is dry-distilled under high pressure, has been erected at Imatra and has started production. The output of the plant, which is the only one of this kind in the country, is estimated at 3,000 tons for 1950. The greatest part of the output will be exported. The domestic requirements for methanol at present hardly exceed 500 tons annually, but it is expected that consumption within the country will considerably increase with large scale use of this liquid in the production of adhesives for the plywood and paper industries.

Malaya

● The export trade in Malayan timbers to "high-class" markets continued to expand, the graded exports for 1949 totaling 22,407 tons of 50 cu. ft. (1.4 m^3). The figures for the first and last quarter of 1949 were 2,358 and 9,821 tons respectively. The rapid expansion of the trade began, in the last quarter of the year to outstrip the Forest Department's capacity to grade. To meet this situation the timber inspectorate has been augmented and in addition the Department extended its training facilities to the employees of sawmills and export concerns. The private inspectors thus trained will be granted certificates of competency to grade timber under the Malayan Grading Rules, but their work will be subject to a percentage check by Government inspectors to ensure that quality standards are maintained. The Malayan Grading Rules were published in July 1948. There is no doubt that their publication has done much to stimulate overseas interest in Malayan timbers and has put the export trade on a firmer basis. Sawmillers have welcomed them because of their flexibility and because they now feel that the lower grades which must inevitably make up a large proportion of their output are at least catered for. Exporters like them for much the same reasons and buyers now know, without much possibility of doubt, what they are likely to get under any given grade and can adjust their purchases to fit end uses and so, it is hoped, please their customers. Probably the most important reason, however, for the popularity of Malayan timbers is that the United Kingdom has, for economic reasons, been forced to curtail drastically its buying in "dollar" areas and is looking to soft currency areas, preferably within the Commonwealth, to fill the gap. This is an opportunity for Malaya with its vast forest wealth to expand its export trade. Valuable though the "high-class" trade is, it is on the less exacting eastern markets that Malaya relies for a steady outlet for its surplus timber production. Such markets as Aden, Arabia, China, Hong Kong, Indonesia, and Mauritius take large quantities of ungraded "run-of-the-mill" material. These exports totaled 46,345 tons in 1949, giving a grand total of sawn timber exports of 68,752 tons.

Poland

● The most recent forest statistics (1945-47) credit Poland with 6,200,000 hectares of forests; this constitutes 22 percent of its territory. The area acquired by Poland through the extension of its western boundary to the Oder river includes 2,500,000 hectares of forests. The principal cuttings during 1948-49 were made in these newly acquired forests because of extensive insect infestation that made necessary immediate sanitation cuttings and because these forests were less affected by the ravages of the war. According to the figures for 1949, the distribution of the forests of Poland by

age groups was as follows:

Up to 20 years	24.7 percent
Up to 40 years	22.6 "
Up to 60 years	18.6 "
Up to 80 years	13.4 "
above 81 years	13.3 "
	92.6 percent

Seven and four-tenths percent of the forests were not classified because of their unmarketability.

A first 3-year forest plan (1947-49) was fulfilled and a further six year plan (1950-55) is now in effect. The country's total yearly timber requirements amount to 14,500,000 m^3. The sawmill industry uses 9 million m^3; the mining industry 2,400,000 m^3; the railways 1 million m^3; other transportation agencies 100,000 m^3; the chemical industry 2 million m^3.

In prewar Poland the annual forest growth was 2 m^3 per hectare; soon after the war it was 1.4 m^3 per hectare and now it is estimated at 2.12 m^3 per hectare.

The foreign trade in timber is being handled by a central monopoly, Polska Agencia Djeva, which states that timber exports for two comparable periods in 1948 and 1949 were as follows:

	Jan.-July 1948	Jan.-July 1949
	(... *Metric tons* ...)	
Timber products	8,854	111,595
Cellulose products	11,825	16,394

At the conclusion of World War II the woodworking industries of Poland were almost entirely disorganized. Soon after the war the large woodworking enterprises were nationalized and reorganization of the industry has been carried forward. According to some figures recently published in a Soviet journal, the industry is now being rapidly developed.

	1945/46	1946/47	1947/48
	(..... *Thousand* m^3 .....)		
Sawn timber	914	1,696	1,911
Veneer	216.5	663.4	1,343.8
Pulp boards	128	236	246

As the output of forest products to meet domestic needs increased, so also did their export and with the reorganization of the wood-using industries the character of the articles exported has also changed. What is now being exported are largely finished or semi-finished products such as furniture, especially bent furniture, boxes, veneer, etc. The industry is also engaged in mass production of standard prefabricated houses, doors, window frames, etc. Sawmilling also has developed. Sawn goods are being exported to some 25 countries. The greatest growth has been in the match industry. In the prewar years all match factories were leased to foreign interests. Today they are state-managed. Per caput consumption of matches is said to be more than three times that of 1938 and Poland has been exporting matches abroad since 1948.

EUROPE

● An article in *Lesnoye Khoziastvo* discusses the forest resources of Albania, Bulgaria, Czechoslovakia, Hungary, Poland, and Romania in relation to each other and to other European countries. The forest situation in those countries during the period 1945-47 was stated to be as follows:

Country	Total forest: Area in million hectares	Total forest: Percentage of total land area	Per caput ha.	Total growth in mill. m^3	Growth per ha. in m^3	Percentage of Conifers
Albania	0.9	32	0.88	1.3	1.4	40
Bulgaria	3.4	33	0.48	5.6	1.5	30
Czechoslovakia	4.0	31	0.30	13.5	2.9	55
Hungary	1.2	13.4	0.13	3.0	2.5	6
Poland	6.2	22	0.35	17.0	2.12	85
Romania	6.5	24	0.38	18.0	2.8	25

(*Editorial Note: The figures for Czechoslovakia, Hungary, and Poland differ somewhat from those provided to FAO by these countries in 1947, and appearing in* Forest Resources of the Wor'd. *Most important changes are increases in estimates of average annual growth per hectare, and consequently of total growth.*)

These figures would indicate that the southeastern European countries, with the exception of Hungary, are well forested. The 22 million hectares of forests comprised in their territories constitute about 17 percent of the estimated 130 million hectares total forest area for Europe, without the U.S.S.R. The total for standing timber in the six countries is estimated at 2,300 million m^3 and annual growth at 60 million m^3. As compared to land in agricultural use, the forests in Poland occupy 34 percent as much land as that under agriculture; in Romania 66 percent; in Czechoslovakia 35 percent; in Bulgaria 78 percent, and in Albania, where the area of agricultural land does not exceed 11 percent of its entire territory, 300 percent.

Forests in these countries have been greatly overcut. In Poland, for instance, in 1926-27 cuttings amounted to 35 to 40 million m^3 a year while the annual growth did not exceed 17 to 18 million m^3. In Romania 20 million m^3 were cut annually against an annual growth of only 18 million m^3. The same was true for the other countries. Timber exports, largely of unprocessed products like round logs, poles, pulpwood, etc., greatly exceeded the volume which the forests could normally produce. Thus Poland, after meeting its domestic needs, in reality could afford to export only 1 million m^3 a year, but exported in some years as much as 10 million m^3. Czechoslovakia, which could normally export between 1.5 and 2 million m^3 a year, exported 6 million m^3. This resulted in depletion of the most accessible productive forests. The present policies provide for repair of the damages of the past, bringing the cutting into balance with the productive capacity of the forests, development of the timber and wood-using industries, and limitation of exports as far as possible to processed or semi-processed forest products.

Policy, Legislation and Administration

FRENCH MOROCCO

● A decree of 12 September 1949 provided for a Moroccan Forestry Fund to be financed by a sales tax of up to 10 percent on the output from forests supervised by the Forest Service. This fund is to be used for the payment of subsidies, bonuses, work on projects, loans, and to defray the miscellaneous expenses entailed in forestry research and experimentation with a view to encouraging forestation or reforestation of government, community, or privately-owned lands.

The establishment of this fund will afford a substantial help in operating large-scale projects already under way in Morocco. Eucalyptus plantations in particular are of increasing importance. It has already been possible to satisfy much of the demand for pitprops of the Djerada coal mines from these projects, and within a matter of years they can easily be expected to supply all the coal fields throughout the country. New plantations at a short distance from the Mamora forest now cover 12,000 hectares, with 8,000 hectares under eucalyptus and 4,000 under acacias and mimoseas which yield tannin. Within about fifteen years, this afforestation work is intended to cover 40,000 hectares.

INDIA

● The Government of India has constituted a Central Board of Forestry to secure close co-ordination in forestry matters and more specially in integrated land use and to help in maintaining adequate standards in forestry education. It will include the Union Minister of Agriculture as Chairman and the following members: the Ministers in charge of Forests in various States and groups of States, the Secretary to the Central Ministry of Agriculture, the Joint Secretary of the Central Agriculture Ministry (Ex-officio Secretary), the Inspector General of Forests of the Government of India, and the President of the Forest Research Institute at Dehra Dun.

The functions of the Board will be: (1) Co-ordination and integration of forest policy pursued by States in the management of their forests; (2) The adoption of conservation measures affecting forest resources and soil; (3) Integration of plans for land use and national reconstruction in which forestry has come to play a progressively important role; (4) Promotion of legislation considered necessary for various States for the management of private forests; (5) Regulation and development of forests in interstate river valleys, which are the concern of the Central Government; (6) Maintenance of adequate standards for the training of officers; (7) Co-ordination of forest research conducted in Central and State Institutes; and (8) any other matters affecting forestry, which are relevant to the objective of the Board. The Board will meet at least once in two years. The Chief Conservators of Forests and Secretaries to Governments will be entitled to attend meetings of the

Board along with their State Ministers.

In the industrial and agricultural development of the country forestry has come to assume a vital role calling for concerted action in such interstate matters as soil conservation and flood control measures, development of industries and standardization of timbers, evolution of forest management and legislation for the control of private forests, regulation of river valleys, and preservation of tree growth in headwaters.

PHILIPPINES

● A step to plug the leakage of forest revenues and to combat illegal cutting of timber has been taken with a new law giving the Director of Forestry better control over the operation of sawmills and closer supervision over the cutting and disposition of timber. There are 460 sawmills in the country, of which 196 operate without having any timber concession. As a result they have to rely on logs from whatever source is available and very often such logs are cut illegally and without payment of forest charges. Under the provisions of the new law no person, association, or corporation shall operate a sawmill without securing a permit from the Director of Forestry who will determine operating conditions.

UNITED KINGDOM

● A comprehensive plan for the development of the Scottish Highlands has been put forward by the Government, designed to encourage the principal industries of agriculture, forestry, fisheries, and touring, the exploitation of national resources and the growth of manufacturing industries, particularly those based on local resources. In the next few years the Forestry Commission proposes to plant 60,000 acres (24,000 ha.). The forest policy aims at the establishment of 7,500 men in permanent forest employment in the woods alone. Plans are being prepared for the planting of 50,000 acres (20,000 ha.) by private owners. The Commission intends to spend nearly £5½ million in the Highlands in 1950-53.

UNITED STATES OF AMERICA

● On 25 August 1950 the President approved an act of Congress to provide for technical services to private forest landowners, operators, and processors. It will be known as the Cooperative Forest Management Act.

● The Society of American Foresters has completed a survey of the employment of its 6,408 members as of 1 January 1950. Returns were received from 60 percent of the members. Based on these returns to its questionnaires, the major breakdown of employment is as follows:

Employer	*Number*
Federal	2,420
Industry	1,560
State	1,080
School	550
Self	350
Association	140
Local	80
Unclassified	228
Total	6,408

In comparison with previous years, the percentage employed by the Federal Government is now 38 percent, compared to 55 percent in 1934; employed by industry, 24 percent compared to 11 percent; by states, 17 percent compared to 16 percent; by schools, 9 percent compared to 12 percent, and in other ways, 12 percent compared to 6 percent in 1934.

A further breakdown of the employment of foresters in the Federal service showed the following distribution:

Employing Agency	*Percent*
Forest Service	71.7
Soil Conservation Service	6.1
Bureau of Entomology and Plant Quarantine	3.7
Bureau of Indian Affairs	3.2
National Park Service	3.0
National Military Establishment	2.2
Bureau of Land Management	2.1
Tennessee Valley Authority	2.0
Bureau of Plant Industry, Soils and Agricultural Engineering	1.8
Fish and Wildlife Service	1.6
Miscellaneous Agencies	2.6
Total	100.0

● At the close of 1949 the American Tree Farm System had spread to 27 states with 2,242 tree farms and a total forest land area of over 20 million acres (8 million ha.). The South led all other regions in growth of tree farms with a total of 1,150,000 acres (465,000 ha.). The program started in the State of Washington in 1941. Since that time the certificates of 82 owners in 9 states holding 233,000 acres (94,000 ha.) of forest have been cancelled due to failure to maintain the prescribed standards of protection and management.

● Use of the national forests for recreation reached an all-time high of over 26 million visits in 1949, an increase of 9 percent over 1948, and thus continuing the year to year increase which has been recorded since the end of the war. The use of improved camp and picnic areas totalled about 11½ million visits, and use of unimproved forest areas for hunting, fishing, hiking, and similar activities totalled nearly 10 million visits. Use for winter sports accounted for about 1¾ million visits. In addition, it is estimated that about 55 million motorists used national forest roads to enjoy the forest environment and scenery.

Meetings

● The Golden Anniversary Meeting of the Society of American Foresters will be held at the Mayflower Hotel, Washington, D. C., 13-16 December 1950.

An organization of 6,800 professional foresters in the United States and Canada, the Society is commemorating its fiftieth year by taking stock of forestry accomplishments during the past half-century and by anticipating developments during the next half-century.

● At meetings of the British Association for the Advancement of Science forestry forms a subdivision of the Botanical Section but sits under its own Chairman and arranges its own program. Professor H. G. Champion, Imperial Forestry Institute, Oxford, reports that at the last meeting, held at Birmingham, England, 30 August—6 September 1950, the Chairman of the Section, Lord Bolton, gave an address on "Some Problems of Post War Forestry," in which he stressed the need for more attention to the management and economic aspects of remedying the wartime excess fellings. This was followed by papers on methods of mixing hardwoods in plantations and the management of private woodlands by cooperative methods.

Discussions on the subjects selected for consideration at this year's forestry meeting are outlined below:

Effect of forest cover in water catchment areas. Papers were read by geographers and engineers as well as by foresters, and it was revealed that no precise information was available on the effect of afforestation of catchment areas in Great Britain. The catchments are mostly in relatively high hilly country, the lower slopes having been denuded of forest while the upper parts are too high for it; they are usually grazed by sheep, and there is sometimes a relatively small amount of arable land; the water supply management authorities are rarely in full control of land use. Perhaps the most interesting matter discussed was the part that may be played by the peat bogs which are frequently present. These bogs undoubtedly serve as storage reservoirs, reducing runoff until they are completely saturated and spreading the flow over a longer period after the rainfall. Afforestation, like pasture amelioration, ordinarily involves the cutting of drains through the bogs, thereby reducing their holding capacity. It was recognized that this matter calls for study.

Climatic limits of vegetation. The rest of the Botanical Section joined in this discussion. The papers fell into two groups: one dealing with tropical vegetation, mainly the factors determining the distribution of the main forest types in Central Africa, and the other dealing with temperate climates and, in particular, the limit of forests in high latitudes or at high altitudes. The possibility of measuring climatic requirements in terms of "accumulated temperature" was presented and discussed. Several speakers referred to the importance of the "exposure" factor which they considered was not given sufficient attention in this connection.

Forest genetics. Professor Lindquist of Sweden and Dr. Syrach Larsen of Denmark stressed the importance of establishing seed orchards using the best available material and of vegetative propagation for preserving and multiplying important genotypes. Mr. J. D. Matthews described the progress made in Great Britain since work started in 1948 and staged an informative exhibit showing methods and procedure.

Rehabilitation of derelict areas. This joint session of the Botanical and Agricultural Sections opened with an address by Sir John Russell on the problem of restoring land which has been worked for gravel, opencast coal, iron ore, limestone, and clay. Rehabilitation involves engineering problems, as well as measures to

replace the top soil and restore its fertility for use under agriculture or forestry. There are many thousands of acres of land rendered derelict by past working and subsidence in the neighborhood of Birmingham, which present particularly difficult problems. There has been marked improvement in methods of restoring the land under opencast mining through measures taken at the time the mineral is being removed from below the soil. Inspections were made of the areas concerned and the results of past attempts at rehabilitation. At present, every effort is being directed to restoring agricultural land to agriculture rather than forestry, while former woodland is often left derelict. Afforestation has been attempted in some of the older areas with varying success, greater success having been obtained with deciduous trees (notably alders and poplars) than conifers, owing to atmospheric pollution.

• The fourth convention of the Asociación Nacional de Productores de Maderas de Pino (National Pine Lumber Producers Association of Mexico) was held at Chihuahua, 12-14 October 1950. The convention was opened by the Governor of the State of Chihuahua who stressed the fact that forest wealth is one of the most important items in the general economy of Mexico and made an eloquent plea to the delegates to subordinate their interests in trade and commerce to ensure rational exploitation of the forests and the proper integration of national wealth. The Association is collaborating with the Government in furthering its measures for conservation and better utilization of forest resources; and to that end has created a forestry section with committees to deal with silvicultural studies and forest integration; waste, utilization, and industrialization; nurseries and reforestation; and fire and pest control. It is also participating actively in the development of publicity through films and other media to foster a better forest consciousness in Mexico.

The Association has shown great interest in the work of FAO and hopes to participate actively in the expanded program of technical assistance. Mr. D. T. Griffiths represented FAO at the convention.

Personalities

Mr. W. A. Robertson, forestry adviser to the United Kingdom Secretary of State for the Colonies, will retire at the end of this year. Mr. F. S. Collier, Chief Conservator of Forests, Nigeria, has been appointed to succeed him.

• Professor Vasconcelos Sobrinho has been appointed Director of the Forest Service of the Ministry of Agriculture, Brazil. He is also President of the Council controlling scientific expeditions in Brazil, and is a member of the Federal Forest Council. Professor Sobrinho has been Director of the School of Agriculture and of the Institute of Agriculture Research in Pernambuco, professor in the Engineering School of the University of Recife, and has been on the faculty of Philosophy, Science, and Literature "Manoel da Nobrega." The Botanical Garden and the Forest Service of the State of Pernambuco were organized by him. His specialized studies have been botany, phytogeography and ecology.

• Dr. James A. Beal is the new head of the Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture. He succeeds Dr. F. C. Craighead who retired recently. Dr. Beal has had wide experience in forest insect work in the United States.

• Malayan forestry has suffered a severe loss in the retirement, on medical grounds, of Mr. T. A. Strong, Director of Forestry, Federation of Malaya. Mr. Strong joined the Malayan service in 1921 and attained the rank of Conservator in 1936. Three years later he was transferred as Conservator of Forests, Ceylon, where he was responsible chiefly for the encouragement of research and, during the war, in the supply of large quantities of timber to the armies of the Middle East. Returning to Malaya as Director of Forestry in 1946 he was particularly successful in the difficult work of postwar rehabilitation in spite of an acute shortage of both men and materials. He was also mainly responsible for the organization of the ambitious forest-road schemes and timber research expansion that are being carried out.

Mr. J. P. Edwards, Deputy Director, is Acting in charge at Kuala Lumpur.

• The Department of Resources and Development, Canada, has announced the appointment of Dr. H. Schwartz as Superintendent of the Forest Products Laboratory, Ottawa. Dr. Schwartz graduated in 1936 from McGill University with a B.Sc. degree in chemistry. In 1939 he obtained a Ph.D. degree in the Department of Industrial and Cellulose Chemistry of McGill graduate school.

Reviews

It is the policy of FAO to review here selected publications which appear to have a direct bearing on the current work of the Forestry and Forest Products Division.

Genetics in Swedish Forestry Practice. Bertil Lindquist. Pp. 173, illus. Chronica Botanica Co., Waltham, Massachusetts, U.S.A. 1948. $3.50.

This work deals with the practical forestry and silvicultural aspects of forest tree breeding and serves as a program and guide for the application of results of genetics work. An extensive bibliography is included. In dealing with the problems of forest tree breeding, probabilities and analogous evidence are the main criteria. Thus long-term progeny tests are essential in appraising the results. Studies begun over 40 years ago have shown that tree form and branch types are hereditary qualities, and the same is true of growth rates; these qualities which determine the value of trees and stands can be used in a practical way.

The forests of Sweden have been utilized for centuries. In the old days when timber of special qualities was required the superior trees were selected and utilized, and thus the genetically superior trees disappeared from the forests. Later, cutting to a diameter limit had more and more effect on the forests, since genetically inferior trees were usually the ones left in residual stands. The process of negative selection of seed trees has become more and more serious, and the end result may be observed in many parts of the country in the form of a severe degeneration of the hereditary constitution of the forests, particularly pine but also spruce, birch, and oak. The practice of leaving broad crowned and intermediate types of trees has been highly undesirable, particularly in pine forests. The usual practices of collecting seed have also contributed to degeneration of the genetical qualities, particularly in the case of pine. Seed from broad-crowned trees bearing abundant cone crops which were readily available and convenient has accentuated the ill effects of tree selection and utilization.

Knowledge of the heredity of stem form and of branching characteristics should and can be used in the treatment of the stand, as well as in the choice of individuals to serve as seed trees. There is reason to believe that the method of keeping young stands very dense through little or no thinning often yields a stand quality inferior to that obtained with moderate thinning which removes material of poor branching types. Genetic appraisal of the tree material is particularly important when stands of seed trees are being formed. In collecting seed, the use of the new one-legged manganese steel ladder makes it possible to obtain cones from the genetically superior trees, that is, the dominating trees of genetically good stands. Thus mapping of pine stands from a seed collecting point of view has been under way for about four years, and the stands have been classified

on the basis of the frequency and proportion of superior trees in the stand. Three classes are recognized: (1) plus areas; (2) normal areas; and (3) minus areas. In plus stands, the undesirable broad-crowned and slow growing trees should be removed quickly, and cones should be collected during good and moderately good cone seasons from trees which will yield about one liter of cones. Normal stands should also be cleared of the broad-crowned trees. Sparse seed tree stands of the genetically desirable trees will be left, and most pine seed should be gathered from such stands by trained teams of workmen under supervision. Minus areas are undesirable because removal of broad-crowned trees amounts to virtual clear-cutting.

The importance of climatic phases has long been known, and a moderate transference of both pine and spruce from the south to the north, or from lower to higher altitudes, meets with little climatic difficulty. A schedule showing the effect of transference has been worked out for both pine and spruce in northern and southern Sweden. In nursery work, heavy culling of the stock is necessary to eliminate particularly small and weak-growing plants, and those with bad branch form and weak leaders.

The annual requirement of conifer seed is estimated at 60 tons, but the average annual production has been only about half this figure. Thus special measures must be taken to obtain genetically superior seed in the quantity required to reconstitute the large areas of forest on which only genetically inferior seed trees remain.

Plantations for seed production seem to be a feasible means of speeding up the production of superior seed. Several methods may be applied to superior individual trees at an early age to stimulate flowering and seed formation. These are strangulation, girdling or bark ringing, and grafting. Grafting in itself gives rise to richer flowering and fruit setting. Fear that superior stock grafted on inferior may inherit the inferior qualities is now known to be groundless. It is estimated that a seed plantation of pine and spruce should normally yield a yearly crop of 50 kilograms per hectare. To obtain 60 tons of seed it would therefore be necessary to have a total plantation of 1,200 hectares (1¼ million trees at the rate of 1,000 trees per hectare). The requirements for oak, birch, ash, and beech plantations are relatively small. Since the difficulties of forming seed plantations are considerable, it is particularly important that grafting of coniferous trees be done only by people with special skill and that the areas be selected carefully so that grafted trees will not be exposed to excessive temperature changes during the period when the graft is uniting with the stock. These seed plantations will be valuable in producing elite seed trees. It is estimated that individual elite trees could be increased at a single center to 10,000 plants in about 10 years. Thus for a given provenance zone there would be no difficulty in propagating 60,000 to 100,000 individuals from the 6 to 10 elite trees chosen, and only about 100 pines should be necessary for all the provenance zones of pine. Sweden has been divided into 10 zones for pine and 6 for spruce. It is important that seed plantation work should be strictly controlled by the government from the start.

An essential step in seeking to improve both quality and quantity of trees and stands is the selection of elite trees, that is, the most extreme plus valuations in branching, timber quality, and growth. A combination of all these qualities is highly uncommon, and balancing of the different factors from the genetic viewpoint is therefore important. Since the elite trees are to become the mother trees for future seed plantations, progeny tests of each selected tree should be started promptly so that the initial appraisal may be verified later. Progeny tests should run for a period of at least 30 to 40 years.

In selecting elite pines, one requirement is that the stems should have at least 50 percent more volume than the average of the three next biggest trees in the immediate vicinity. Moreover, trees which have poor heartwood formation should be rejected. In the inventory so far conducted, about 3,000 elite pine have been registered, and progeny tests have been started from all these trees which have set cones. About 10 percent have been selected for a more detailed examination and progeny testing. About 100 of the selected trees have given very superior progeny with quick growth and have been chosen for grafting and mass breeding during the next years.

Requirements for spruce are mass superiority in growth and a branch formation which is not too coarse. German spruces have been found in progeny tests to possess better growth than the Swedish spruce. In making progeny tests, the susceptibility of the young plants to frost should be taken into account.

The choice of elite birch trees is complicated since the value of this species depends on wood quality for ski wood, furniture wood, and various special types of plywood. The boles should be straight and the base of the stem round. A much stricter control of the wood properties is necessary for birch than for pine and spruce. In the inventory of elite trees, ice birch, browned curly-grained birch, flamy birch, hard glossy birch, and soft glossy birch have been recognized as types of wood suitable for industry. These are fast growing varieties.

Oak has suffered particularly from degeneration through wrong treatment, and protection of the remaining superior oak is particularly urgent. Requirements for elite trees are very strict; they include straightness and length of bole, good branching, minimum number of epicorms, and light, well-developed, evenly colored heartwood. So far, only about 30 elite oak trees have been found in the whole of Sweden, and this illustrates the importance of establishing seed plantations of elite trees.

The requirement for ash is that the heartwood of the trees should not be brown. Seed plantations could soon be established, and planting stock produced for large areas. Requirements for elite trees of alder, elm, beech, maple, etc., generally include rapid growth, straight stem, and relatively good type of branching. Among exotics, only some species of poplar, larch, Douglas fir, and Sitka spruce are regarded as worth genetical work in Sweden.

At present, it is only by agreement and persuasion that elite trees and plus stands can be preserved intact, and there is always danger of damage from too much and careless climbing for the cone harvest. It is therefore essential that more reliable procedures for preserving the genetically superior stands and elite trees be worked out.

It must be recognized that for a good many years high class seed will not be available for general use. The government should see to it that particular care is given to selecting choice and accessible sites, putting the right species on the right soils, and protecting plantations of elite stock from forest grazing.

Genetical knowledge should be applied in thinning the present young stands, particularly pine, birch, and oak. In this way, great improvement may be expected. In some new stands the sowing of better seed may result in 100 percent increase in quality for beech and oak, and lesser quality improvement for spruce and pine. Increased volume production should also be obtained from plus stands since the breeding material is derived from the dominant stands. There is also the possibility that the genetically desirable narrow-crowned trees may be able to grow closer together than the broad-crowned trees. All in all, increased growth is to be expected. Once the most desirable tree form is available, it will be possible to increase the spacing in plantations and thus reduce both planting and tending expenses. This will be important because of the migration of forest workers to the cities and the increasing difficulty of obtaining sufficient labor. The effect of increased growth in elite stands is likely to be reflected in somewhat shorter rotations.

Coniferen. Ephedra en Ginkgo. (Coniferae, Ephedraceae, and Ginkgoales). P. den Ouden. Pp. 444 + 160 illus. H. Veenman & Zonen, Wageningen, Holland. 1949. $7.75 in the U.S.A.; $8.50 in Canada.

The author describes about 900 species and varieties of conifers which can be found growing in the Netherlands and Belgium. Important details are given regarding species of interest to commercial growers and to landscape architects and garden owners, including the cultivation of varieties and protection against insects and pests. The author is preparing a supplement covering conifers and related species growing all over the world, and would be glad to hear of new varieties. His address is: Rozenlaan 50, Boskoop, Netherlands.

Tree Crops. J. Russell Smith. Pp. 408, illus. The Devin-Adair Company, New York. 1950. $6.00.

The Fifth Session of the FAO Conference (1949) supported the suggestion of the Delegate for Mexico that the planting of trees, particularly on hillsides, which could make a direct contribution to food supplies for animal and human use, should be explored in connection with the study of reforestation methods. In his fascinating and thoughtful book, Dr. J. Russell Smith, who is not only a horticulturist but also an economist, writer, and widely travelled geog

rapher, makes a solid contribution towards this important study. After wide travel he is justly perturbed at the spread of soil erosion, the cycle of "forest, field, plough, desert" and the increasing incidence of the transfer of the agriculture of the flat plain to the hills, with the devastating results so well known and so plainly to be seen throughout most of the world. His way out is tree crops, and his plan is an institute of mountain agriculture. He demonstrates the desirability of tree crops on poor mountain land—crops that will provide not only wood but also food for both animal and man, crops that can be managed in connection with grazing and agricultural crops proper.

Forestry and Flood Control in Japan. C. J. Kraebel. Pp. 29. General Headquarters, Supreme Commander for the Allied Powers, Natural Resources Section, Tokyo, Japan. (Preliminary Study No. 39.) 1950.

Flood and erosion damage in Japan has developed to a stage where it has become a national emergency. Losses of food crops, damage to paddy lands, erosion of soils, and destruction of life and property are seriously retarding the economic rehabilitation of Japan. In recognition of the seriousness of this situation, the Supreme Commander for the Allied Powers invited Mr. Kraebel, a watershed management specialist of international reputation, to investigate the extent of the influence of forests on flood control in Japan. The significance of this study is indicated by the fact that in Japan, which is only four-fifths the size of California, the annual flood losses now exceed those of the entire United States and are steadily increasing. In 1942 an estimated 133,000 acres (53,800 hectares) of agricultural land and facilities were damaged and by 1948 this had increased to 1,915,000 acres (775,000 hectares).

Basically the problem is severe because of the rugged topography, high intensity rainfall, pressure of a dense population on the land, and steepness of the river gradients. But it is clearly evident that the increase and intensification of flood damage has been caused by the unwise use of large areas of mountain lands. The relationship between denudation of forests and flood damage to agriculture is indicated by the changes between 1929 and 1950: denuded forest land increased from 441,000 acres (178,000 hectares) to 7,355,000 acres (2,977,000 hectares), and the area of damaged farmland increased from about 5,000 acres (2,000 hectares) to 75,000 acres (30,000 hectares). It is evident that an expanded and vigorous program of flood control, with particular emphasis on headwaters areas, is imperative. A great deal of work on levees and simliar works has been done in the lowlands, but these are not generally successful.

The general recommendations for flood control programs through forestry work include: (1) co ordination of governmental efforts; (2) preparation of comprehensive plans for each important watershed, which will integrate for the first time the programs for headwaters, middle stream, and downstream areas; (3) upstream improvement work through planting, erosion control structures, and other improvement works, the need for this being indicated by the fact that in 10 important reservoirs the sedimentation has reached 47 percent of the reservoirs' capacity in a period of less than 14 years; (4) equalization of forest use to spread cutting more evenly, since more accessible areas are presently severely overcut; (5) research based on training of selected Japanese technicians in research methods at American centers; (6) in-service training so that officers may be properly indoctrinated in the problems and methods for solution of flood control through forestry.

Specific recommendations include: (1) abolition of clear-cutting, the present ruling practice, so that sufficient forest cover and litter may remain on the ground to minimize flood runoff; (2) prompt planting of overcut forest land with limitation of the interplanting of food crops; (3) building of a more adequate system of forest roads to remove the necessity for log skidding and the present practice of skidding directly down the slope; (4) control of the collection of litter so that enough litter may remain on the ground to control runoff and erosion; (5) control of the use of mountain grasslands which are presently overused for grazing; (6) control of conversion of forest to grasslands to areas with slopes of less than 40 percent; (7) control of cultural practices on upland farming so that terracing and other methods may be applied in lieu of the present practice of up and down hill arrangement of row crops.

The costs of such a program will, of course, be great, but the alternative of accepting increasing losses would lead to really severe trouble in a fairly short period.

Anuario Brasileiro de Economia Forestal, 1949. (Brazilian Yearbook of Forest Economy, 1949.) Pp. 600. Second Yearbook. Instituto Nacional do Pinho, Rio de Janeiro, Brazil. 60 Cruzeiros. (1948 and 1949 Yearbooks —100 Cruzeiros.)

Because books and periodicals dealing with forestry and forest products problems in Latin America are still relatively scarce, the publication of this yearbook in Brazil is of particular interest. The volume for 1949 has an introductory statement by the President of Brazil stressing the importance of proper soil conservation and an article by the President of the Instituto Nacional do Pinho summing up the work carried out by the institute since its creation in 1940 and explaining its present organization and future programs. There are 37 other articles written by the staff of the institute and by Brazilian and foreign technicians on various forestry and forest utilization problems. Of the many interesting articles, those dealing with the following subjects should be mentioned: The Pine Forests of Brazil, Timbers Exported by Brazil, Brazilian Timber Prices 1939-1948, Sawmilling Schools, Brazilian Timber Used for Sleepers, The Quinine Tree and Its Cultivation, and The Experimental Plywood Plant in Curitiba. The articles, each of which is accompanied by a summary in English, give a concise picture of the problems confronting the Brazilian authorities and technicians in their task of arriving at a sound program for the conservation and development of the forest resources, and they also point up the research work and modernization programs needed to help the forest industries to produce and export a better product.

There is a list of commercial tree species, with a standardized nomenclature and a description of their physical and chemical properties, as well as 37 pages of statistical data on production, imports, and exports.

Some Geographic and Economic Aspects of the Cork Oak. Victor A. Ryan. Pp. 116, illus., 10 maps. Crown Cork and Seal Company, Inc., Baltimore, Maryland, U.S.A. 1948.

A former president of the company of which Mr. Ryan is Director of Research initiated a project in 1939 to establish a domestic cork oak industry in the United States of America. Plantings have gained such impetus, especially as a result of cork being classified as a "critical material" in the recent world war, that the author decided to make this comprehensive study to supplement earlier work.

This interesting study, copies of which the company has kindly offered to supply to those interested, includes chapters on The Natural Distribution of the Cork Oak, Geographic Environment of the Cork Oak, Apparent Rate of Growth of Cork Oak, and The Cork Potentiality of the U.S.A.

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1950 YEARBOOK OF FOREST PRODUCTS STATISTICS, published by the Food and Agriculture Organization of the United Nations, 1201 Connecticut Ave., NW, Washington 6, D.C., U.S.A. Bilingual: English-French, with Spanish supplement. Paper bound, 8½ x 11 in., 182 pp. Price US $2.50; 17*s.* 6*d.* Available in *national currencies* when orders are placed through local FAO sales agents.

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